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TASK I STAGE FINAL REPORT

VOLUME II

EVALUATION OF RANGE AND DISTORTION TOLERANCE FOR HIGH MACH NUMBER TRANSONIC FAN STAGES

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16. Abstract

This report documents the performance and discusses the results of testing a single-stage 1400 ft/sec tip speed transonic compressor. Objectives of the program were to investigate efficiency, weight flow range, and tolerance to distorted inlet airflows. Tests were conducted with undistorted inlet flow and with both radial and circumferential inlet flow distortions. With undistorted inlet flow, the stage demonstrated a peak adiabatic efficiency at 100% design speed of 0.852 at a total-pressure ratio of 1.624 and an inlet corrected weight flow of 217.2 lb/sec. Stall margin of over 20% was obtained at the above operating condition. Radial and circumferential inlet flow distortions caused substantial reductions in unstalled weight flow range and efficiency.

Volume I (NASA CR-72806) of this report contains a description of test apparatus and procedure, presentation and analysis of the experimental results, and graphical presentations of the data. Volume II contains tabulations of the computer output of the data reduction programs. Overall performance data are listed for all undistorted and distorted inlet flow tests; blade element data are listed for both undistorted and radial distortion tests; and, vector diagram data are listed for tests with circumferential inlet flow distortion.

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SYMBOLS

APPENDIX A

SYMBOLS

Symbol	Description	Units
A	Annulus or streamtube area	$In.^2$
a	Length along chord line to location of maximum displacement between camber line and chord line	In.
C	Chord length of cylindrical section	In.
C_h	Enthalpy - equivalent static-pressure-rise coefficient: $C_h = \dfrac{2gJ\ c_p t_1 \left[\left(\frac{p_2}{p_1}\right)^{\frac{\gamma-1}{\gamma}} - 1\right] - (U_2^2 - U_1^2)}{V_1'^2}$	---
C_p	Static-pressure-rise coefficient: $C_p = \dfrac{p_2 - p_1}{p_1' - p_1}$	---
c_p	Specific heat at constant pressure	Btu/Lb-° R
D	Diffusion factor: $D_{rotor} = 1 - \dfrac{V_2'}{V_1'} + \dfrac{r_2 V_{\theta 2} - r_1 V_{\theta 1}}{2\bar{r}\ \sigma\ V_1'}$	---
	$D_{stator} = 1 - \dfrac{V_2}{V_1} + \dfrac{r_1 V_{\theta 1} - r_2 V_{\theta 2}}{2\bar{r}\ \sigma\ V_1}$	---
g	Acceleration due to gravity	32.174 Ft/Sec^2
i	Incidence angle, difference between flow angle and camber line angle at leading edge in cascade projection	Degrees

Symbol	Description	Units
i_{SS}	Suction surface incidence angle, difference between flow angle and leading edge suction surface	Degrees
J	Mechanical equivalent of heat	778.161 Ft-Lb/Btu
M	Mach number	---
N	Rotational speed	RPM
P	Total or stagnation pressure	PSIA
p	Static pressure	PSIA
r	Radius	In.
$\bar{r}$	Mean radius, average of streamline leading-trailing edge radii	In.
T	Total or stagnation temperature	° R
ΔT	Total temperature rise	° R
t	Static temperature	° R
t_e	Airfoil edge thickness	In.
t_m	Airfoil maximum thickness	In.
U	Rotor speed	Ft/Sec
V	Air velocity	Ft/Sec
W	Weight flow	Lbs/Sec
Z	Displacement along compressor axis	In.
β	Flow angle, angle whose tangent is the ratio of tangential-to-axial velocity	Degrees
$\Delta\beta$	Air-turning angle, $\Delta\beta = \beta_1 - \beta_2$	Degrees
$\gamma°$	Blade-chord angle (stagger), angle in cascade projection between blade chord and axial direction	Degrees
γ	Ratio of specific heats	---
$\delta°$	Deviation angle, difference between flow angle and camber-line angle at trailing edge in cascade projection	Degrees

Symbol	Description	Units
δ	Pressure correction, $\frac{P_{actual}}{14.696\ PSIA}$	---
$\epsilon°$	Slope of meridional streamline	Degrees
θ	Temperature correction, $\frac{T_{actual}}{518.7°\ R}$	---
$\theta°$	Circumferential position from top center	Degrees
η	Efficiency	---
$\varkappa°$	Angle between tangent to blade meanline and the axial direction	Degrees
σ	Solidity, ratio of chord to spacing	---
$\Phi°$	Camber angle, difference between angles in cascade projection of tangents to camber line at extremes of camber-line arc	Degrees
φ	Flow coefficient	---
ψ	Work coefficient	---
$\bar{\omega}$	Total-pressure-loss coefficient:	
	Rotor, $\bar{\omega}' = \frac{P_2'_{id} - P_2'}{P_1' - p_1}$	---
	Stator, $\bar{\omega} = \frac{P_1 - P_2}{P_1 - p_1}$	---
$\frac{\bar{\omega}\ \cos\ \beta_2}{2\sigma}$	Total-pressure-loss parameter	---

Subscripts

ad	Adiabatic
an	Annulus
cor	Corrected to unity axial velocity ratio
d	Downstream measurement plane (Table V)

Subscripts	Description
e	Edge of blade (Figure 10)
h	Hub
id	Ideal
j	Immersion
m	Meridional direction
p	Polytropic
S	Measurement plane (Figure 10)
SS	Suction surface
t	Tip at Station 1.0
u	Upstream measurement plane (Table V)
z	Axial direction
θ	Tangential direction
o	Corrected to zero inlet swirl
1	Leading edge
2	Trailing edge
0.01, 0.18, 0.95, 1.51, 2.20	Measurement station designations (Figures 7 and 8)

Superscripts

'	Relative to rotor
*	Critical flow condition

APPENDIX B

DUPLICATE LISTING OF TABLE VII, OVERALL PERFORMANCE DATA

The overall performance data for the stage and for the rotor are presented in Table VII which is repeated here from Volume I for convenience.

Table VII. Listing of Overall Performance Data.

(a) Shakedown Test With Undistorted Inlet

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*	Stator Setting (deg)
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency		
1	50.3	50	125.62	1.0786	0.7572	1.0910	0.8728	O.P.	0
2	50.0	50	125.20	1.0780	0.7297	1.0903	0.8417	O.P.	0
3	50.1	2	89.41	1.1376	0.7752	1.1426	0.8018	O.P.	0
4	70.1	50	172.11	1.1509	0.7148	1.1809	0.8491	O.P.	0
5	70.1	3	130.21	1.2820	0.7918	1.2918	0.8171	O.P.	0
6	90.1	30	205.73	1.2683	0.6795	1.3242	0.8078	O.P.	0
7	90.1	6	183.53	1.5319	0.8457	1.5510	0.8718	O.P.	0
8	100.2	25	221.12	1.3440	0.7135	1.3894	0.7976	O.P.	-3
9	100.1	15	220.61	1.4617	0.8148	1.4804	0.8438	O.P.	-3
10	100.0	15	219.52	1.4600	0.8100	1.4796	0.8400	B.E.	-3
11	100.0	9	216.48	1.6190	0.8391	1.6445	0.8674	B.E.	-3
12	100.1	9	216.51	1.6208	0.8322	1.6570	0.8731	O.P.	-8
13	100.2	9	217.29	1.6218	0.8363	1.6428	0.8602	O.P.	0
14	100.0	9	217.29	1.6262	0.8460	1.6463	0.8689	O.P.	+4
15	100.0	9	216.50	1.6428	0.8553	1.6617	0.8764	O.P.	+8
16	100.0	15	221.67	1.4601	0.7902	1.4826	0.8240	O.P.	0
17	99.8	6.15	204.95	1.7034	0.8427	1.7346	0.8737	O.P.	0
18	100.0	6.15	202.98	1.6932	0.8324	1.7359	0.8614	O.P.	-3
19	100.1	9	213.81	1.6547	0.8455	1.6810	0.8740	O.P.	+11
20	100.0	6.15	206.83	1.7194	0.8478	1.7397	0.8676	O.P.	+8
21	110.1	9	230.38	1.7088	0.8100	1.7359	0.8358	O.P.	0
22	90.1	9	196.74	1.4830	0.8680	1.4992	0.8933	O.P.	0
23	80.1	9	175.28	1.3567	0.8762	1.3688	0.9030	O.P.	0
24	80.1	3.5	149.79	1.3890	0.7952	1.4053	0.8248	O.P.	0

*The following symbols indicate the type of data recorded:

OP - Overall Performance Data From Fixed Instruments

BE - Blade Element Traverse Data Plus Overall Performance

CT - Continuous Traverse Data Plus Overall Performance

SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(b) Undistorted Inlet Performance Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
25	100.0	15	221.89	1.4587	0.8111	1.4811	0.8457	B.E.
26	100.0	15	221.12	1.4589	0.7964	1.4814	0.8305	O.P.
27	100.0	9	217.17	1.6239	0.8518	1.6463	0.8776	B.E.
28	100.0	6	204.03	1.7037	0.8281	1.7377	0.8613	B.E.
29	100.1	7.5	212.65	1.6761	0.8504	1.7020	0.8776	B.E.
30	100.1	11	219.33	1.5630	0.8461	1.5805	0.8686	B.E.
31	90.2	15	204.39	1.3761	0.8212	1.3946	0.8574	B.E.
32	90.0	9	196.56	1.4863	0.8739	1.5001	0.8955	B.E.
33	90.0	7.5	192.81	1.5105	0.8706	1.5256	0.8928	B.E.
34	90.0	6	183.44	1.5269	0.8465	1.5457	0.8726	B.E.
35	90.1	30	205.36	1.2726	0.7030	1.3206	0.8153	B.E.
36	50.1	30	123.15	1.0861	0.8127	1.0958	0.9012	B.E.
37	50.1	30	123.20	1.0860	0.8095	1.0957	0.8983	O.P.
38	50.0	15	114.70	1.1073	0.8463	1.1129	0.8889	B.E.
39	50.0	11	109.34	1.1166	0.8796	1.1210	0.9115	B.E.
40	50.0	9	106.75	1.1213	0.8831	1.1251	0.9094	O.P.
41	50.1	6	100.80	1.1288	0.8504	1.1321	0.8712	B.E.
42	50.1	2	89.28	1.1369	0.8065	1.1416	0.8333	B.E.
43	70.1	30	169.98	1.1674	0.7937	1.1910	0.8989	B.E.
44	70.1	15	160.99	1.2193	0.8858	1.2311	0.9304	B.E.
45	70.0	9	151.55	1.2548	0.8909	1.2628	0.9166	B.E.
46	70.0	6	141.97	1.2712	0.8465	1.2788	0.8682	B.E.
47	70.1	3	128.91	1.2809	0.7950	1.2910	0.8212	B.E.
48	80.1	30	188.52	1.2131	0.7417	1.2442	0.8420	B.E.
49	80.1	15	185.71	1.2927	0.8507	1.3087	0.8930	B.E.
50	80.0	9	174.54	1.3534	0.8755	1.3642	0.8996	B.E.
51	80.1	6	162.43	1.3814	0.8468	1.3927	0.8691	B.E.
52	80.1	3.5	150.16	1.3864	0.7942	1.4026	0.8237	B.E.
53	90.1	11	199.43	1.4435	0.8666	1.4587	0.8927	O.P.
54	100.1	25	220.48	1.3419	0.6839	1.4000	0.7872	O.P.

*The following symbols indicate the type of data recorded:

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SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(b) Undistorted Inlet Performance Test (Concluded)

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
55	100.1	15	219.94	1.4643	0.8087	1.4860	0.8416	C.T.
56	100.1	9	216.33	1.6144	0.8474	1.6335	0.8698	C.T.
58	100.0	6	202.06	1.6934	0.8356	1.7279	0.8701	C.T.
59	50.0	4	96.17	1.1350	0.8271	1.1411	0.8625	O.P.
60	50.1	4	95.00	1.1331	0.8045	1.1364	0.8237	O.P.
61	70.0	3	129.66	1.2808	0.7886	1.2913	0.8155	O.P.
62	80.0	2.45	143.40	1.3852	0.7693	1.4057	0.8057	O.P.
63	90.1	5	176.81	1.5292	0.8140	1.5521	0.8443	O.P.
64	100.0	5.5	198.11	1.6968	0.8064	1.7370	0.8451	O.P.
65	110.2	9	230.47	1.7044	0.8073	1.7305	0.8322	O.P.
66	110.1	7	226.68	1.8307	0.8101	1.8738	0.8441	O.P.
67	109.9	9	229.89	1.7045	0.8079	1.7298	0.8320	B.E.
68	109.9	9	230.02	1.7049	0.8119	1.7304	0.8363	O.P.
69	110.3	6.75	225.55	1.8502	0.8030	1.9015	0.8421	B.E.
70	110.1	7.25	228.61	1.8148	0.8168	1.8554	0.8498	B.E.
71	110.0	8	228.43	1.7584	0.8155	1.7884	0.8420	B.E.
72	110.2	13	230.69	1.5656	0.7764	1.5920	0.8074	B.E.
73	50.0	15	114.97	1.1067	0.8471	1.1121	0.8887	O.P.
74	80.1	11	179.07	1.3353	0.8795	1.3468	0.9067	O.P.

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Table VII. Listing of Overall Performance Data (Continued).

(c) Undistorted Inlet Test with Long Inlet Duct

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
132	70.0	30	168.95	1.184	0.8056	1.199	0.8750	O.P.
133	70.1	9	146.34	1.259	0.8229	1.268	0.8750	O.P.
134	70.1	3	126.37	1.275	0.7568	1.288	0.8018	C.T.
135	100.1	15	220.37	1.486	0.8294	1.506	0.8588	O.P.
136	100.1	9	214.61	1.633	0.8510	1.658	0.8846	O.P.
137	100.1	6.5	202.34	1.681	0.8333	1.722	0.8728	C.T.
138	90.0	30	204.18	1.290	0.7521	1.321	0.8376	O.P.
139	90.1	9	194.21	1.484	0.8554	1.500	0.8795	O.P.
140	90.1	5.5	177.75	1.525	0.8162	1.541	0.8432	C.T.

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Table VII. Listing of Overall Performance Data (Continued).

(d) Radial Inlet Distortion Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
75	70.0	50	167.99	1.1878	0.7761	1.2078	0.8534	O.P.
76	70.0	10	148.40	1.2657	0.8385	1.2745	0.8639	O.P.
77	70.0	15	156.89	1.2440	0.8235	1.2546	0.8671	O.P.
78	90.1	50	202.87	1.2882	0.6989	1.3236	0.7769	O.P.
79	90.0	11	195.05	1.4623	0.8259	1.4777	0.8500	O.P.
80	90.0	15	198.33	1.4139	0.8130	1.4309	0.8424	O.P.
81	100.0	50	216.41	1.3359	0.6650	1.3803	0.7436	B.E.
82	100.0	10.5	212.58	1.5914	0.8003	1.6129	0.8251	B.E.
83	100.0	14	215.95	1.5168	0.7854	1.5377	0.8130	B.E.

*The following symbols indicate the type of data recorded:

OP - Overall Performance Data From Fixed Instruments
BE - Blade Element Traverse Data Plus Overall Performance
CT - Continuous Traverse Data Plus Overall Performance
SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Concluded).

(e) Circumferential Inlet Distortion Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*	Dist. Screen And Position (deg.From TDC)
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency		
84	70	50	165.2	1.192	.746	1.214	.826	O.P.	195
85	70	5	130.8	1.285	.757	1.300	.793	O.P.	
86	70	10	146.6	1.269	.818	1.283	.857	O.P.	
87	90	50	204.4	1.319	.763	1.358	.848	O.P.	
88	90	7.5	179.0	1.501	.818	1.526	.853	O.P.	
89	90	11	192.1	1.469	.831	1.494	.870	O.P.	
90	100	50	220.1	1.390	.738	1.445	.829	O.P.	
91	100	9.6	204.6	1.604	.820	1.638	.858	O.P.	
92	100	13	213.5	1.556	.830	1.583	.865	O.P.	195
93-104	100	9.6	205.3	1.602	.816	1.638	.853	SRT	195-165
105	100	9.6	205.8	1.602	.814	1.637	.854	O.P.	195
106-117	100	50	219.2	1.389	.736	1.447	.828	SRT	195-165
118	100	50	218.3	1.389	.736	1.448	.833	O.P.	195
119-130	100	13	211.9	1.555	.828	1.582	.862	SRT	195-165
131	100	13	212.3	1.555	.831	1.583	.867	O.P.	195

*The following symbols indicate the type of data recorded:

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CT - Continuous Traverse Data Plus Overall Performance
SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

APPENDIX C

SYMBOLIC LISTING OF ROTOR AND STATOR BLADE ELEMENT DATA

Symbolic identification for the various column headings in the tabulation of blade element data to be presented in Appendixes D and E is presented in Table VI. This table is repeated here from Volume I for convenience.

TABLE VI SYMBOLIC LISTING OF BLADE ELEMENT DATA

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER READING NUMBER DATE

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1										
2										
3										
4	β_1'	β_1	κ_1°	i	i_{ss}	V_1	V_1'	V_{z1}	$V_{\theta 1}$	$V_{\theta 1}'$
5										
6										
7										

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1										
2										
3										
4	β_2'	β_2	κ_2°	δ°	$\Delta\beta'$	V_2	V_2'	V_{z2}	$V_{\theta 2}$	$V_{\theta 2}'$
5										
6										
7										

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CH1
1										
2										
3	U_1	M_1	M_1'	$\frac{V_{z2}}{V_{z1}}$	$\bar{\omega}'$	$\frac{\bar{\omega}' \cos \beta_2'}{2\sigma}$	η_{ad}	η_p	D	C_h
4										
5										
6										
7										

Method 2, Traverse Inst.

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1										
2										
3	U_2	M_2	M_2'	σ	$\bar{\omega}'$	$\frac{\bar{\omega}' \cos \beta_2'}{2\sigma}$	η_{ad}	η_p	$\frac{U_2 V_{\theta 2} - U_1 V_{\theta 1}}{J g c_p \Delta T}$	C_p
4										
5										
6										
7										

Method 1, Fixed & Traverse Instr.

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000				
2	10.0000	$\frac{P_{1.51}}{P_{0.95}}$	$\frac{T_{1.51}}{T_{0.95}}$	$\frac{P_{1.51}}{P_{0.95}}$	$\frac{T_{1.51}}{T_{.95}}$
3	30.0000				
4	50.0000				
5	70.0000				
6	90.0000				
7	95.0000				

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio	=	$P_{2.20}/P_{0.18}$	$P_{1.51}/P_{0.95}$	$P_{1.51}/P_{0.95}$
Adiabatic Efficiency	=	η_{ad}	η_{ad}	η_{ad}
Polytropic Efficiency	=	η_p	η_p	η_p
Percent Design Speed	= $\%N/\sqrt{\theta}$	Discharge Valve Setting=		
Cor. Nozzle Weight Flow	= $w\sqrt{\theta}/\delta$	Vane Schedule	=	Stator
LE Check Flow/Noz.Flow	=	TE Check Flow/Noz.Flow	=	
Assumed LE Flow Coeff.	=	Assumed TE Flow Coeff.	=	

TABLE VI SYMBOLIC LISTING OF BLADE ELEMENT DATA (Concluded)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

	POINT NUMBER	READING NUMBER	DATE						
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1 2 3 4 5 6 7	*N/A	β_1	κ_1°	i	N/A	V_1	N/A	V_{z1}	$V_{\theta 1}$	N/A
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1 2 3 4 5 6 7	N/A	β_2	κ_2°	δ°	$\Delta\beta$	V_2	N/A	V_{z2}	$V_{\theta 2}$	N/A
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO					DIFFUSION FACTOR	CH1
1 2 3 4 5 6 7	N/A	M_1	N/A	$\frac{V_{z2}}{V_{z1}}$					D	C_h
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1 2 3 4 5 6 7	N/A	M_2	N/A	σ	$\bar{\omega}$	$\frac{\bar{\omega}\cos\beta_2}{2\sigma}$	N/A	η_p	N/A	C_p

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000				
2	10.0000	$\frac{P_{2.2}}{P_{1.51}}$	$\frac{T_{2.2}}{T_{1.51}}$	$\frac{P_{2.2}}{P_{1.51}}$	$\frac{T_{2.2}}{T_{1.51}}$
3	30.0000				
4	50.0000				
5	70.0000				
6	90.0000				
7	95.0000				

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	$P_{2.20}/P_{0.18}$	$P_{2.20}/P_{1.51}$	$P_{2.20}/P_{1.51}$
Polytropic Efficiency =	η_p	η_p	-------
Percent Design Speed = $\%N/\sqrt{\theta}$	Discharge Valve Setting=		
Cor. Nozzle Weight Flow= $W\sqrt{\theta}/\delta$	Vane Schedule =		Stator
LE Check Flow/Noz.Flow =	TE Check Flow/Noz.Flow =		
Assumed LE Flow Coeff. =	Assumed TE Flow Coeff. =		

* Not Applicable: NA

APPENDIX D

TABULATIONS OF BLADE ELEMENT DATA FOR UNDISTORTED INLET TESTING

The blade element data for rotor and stator for undistorted inlet flow testing, obtained from fixed and traverse instruments, are presented in this appendix. The readings are arranged in an ascending order of speed and at each speed in an ascending order of stage total pressure ratio.

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Blade Element Data For Undistorted Inlet Testing

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 1 READING NUMBER 36 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.73	0.	60.60	4.13	1.43	323.31	752.55	320.83	0.	679.56
2	63.68	0.	59.61	4.07	1.04	329.92	741.98	328.76	0.	664.59
3	60.72	0.	56.01	4.71	0.25	336.28	687.62	336.27	0.	599.78
4	56.07	0.	50.56	5.51	-0.33	333.90	630.04	332.94	0.	534.28
5	55.36	0.	49.71	5.65	-1.14	327.63	571.04	323.09	0.	467.71
6	53.17	0.	47.11	6.06	-1.60	307.26	499.49	294.91	0.	393.80
7	51.68	0.	46.13	5.55	-2.35	308.82	483.07	293.54	0.	371.46

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.87	19.43	54.80	4.07	5.85	356.21	648.22	334.74	118.08	554.30
2	58.38	19.86	54.42	3.96	5.30	353.33	632.61	331.35	119.72	538.23
3	54.19	21.94	50.68	3.51	6.53	360.92	572.11	334.68	134.82	463.93
4	47.67	24.69	43.79	3.88	10.41	380.86	513.76	348.96	159.07	379.74
5	37.07	29.62	32.15	4.92	18.30	416.60	453.70	361.22	205.36	272.87
6	22.70	35.92	14.29	8.41	30.47	456.69	402.09	366.04	265.20	153.10
7	19.01	34.94	8.00	11.01	32.67	479.23	417.60	386.94	270.29	133.34

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	679.56	0.292	0.679	1.043	0.197	0.209
2	664.59	0.298	0.670	1.008	0.206	0.229
3	599.78	0.304	0.621	0.995	0.233	0.281
4	534.28	0.302	0.569	1.039	0.260	0.315
5	467.71	0.296	0.516	1.118	0.301	0.337
6	393.80	0.277	0.451	1.241	0.318	0.280
7	371.46	0.279	0.436	1.318	0.260	0.256

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS # RISE	STAT PRESS RISE COEFF
1	672.38	0.317	0.577	1.3340	0.116	0.022	0.6686	0.6716	0.8246	0.175
2	657.95	0.315	0.564	1.3690	0.043	0.008	0.8750	0.8765	0.8665	0.195
3	598.75	0.322	0.510	1.5080	0.032	0.006	0.9200	0.9210	0.8601	0.260
4	538.81	0.339	0.458	1.6840	0.048	0.010	0.9048	0.9060	0.8605	0.310
5	478.23	0.372	0.405	1.9060	0.036	0.007	0.9428	0.9436	0.9048	0.353
6	418.30	0.408	0.359	2.2170	0.044	0.009	0.9510	0.9518	0.9692	0.349
7	403.63	0.429	0.373	2.3390	0.075	0.015	0.9247	0.9260	0.9026	0.352

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.075	1.031	1.066	1.028
2	10.0000	1.076	1.029	1.083	1.026
3	30.0000	1.086	1.030	1.089	1.027
4	50.0000	1.094	1.032	1.096	1.029
5	70.0000	1.108	1.035	1.104	1.030
6	90.0000	1.119	1.037	1.119	1.034
7	95.0000	1.128	1.039	1.121	1.035

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.0861	1.0958	1.0955
Adiabatic Efficiency =	0.8127	0.9012	0.8108
Polytropic Efficiency =	0.8149	0.9025	0.8133

Percent Design Speed = 50.1 Discharge Valve Setting= 30.0
Cor. Nozzle Weight Flow= 123.15 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0101 TE Check Flow/Noz.Flow = 0.9693
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.990

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Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 1 READING NUMBER 36 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		19.34	39.47	-20.13		357.92		337.73	118.51	
2		19.54	39.11	-19.57		359.25		338.55	120.15	
3		20.80	39.01	-18.21		379.47		354.50	134.69	
4		23.07	39.80	-16.73		402.92		369.73	157.49	
5		27.57	40.86	-13.29		437.17		384.98	201.02	
6		33.64	42.22	-8.58		466.85		384.31	255.69	
7		32.67	42.76	-10.09		487.17		404.73	259.50	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.74	-11.13	10.39	20.08	339.45		339.42	-4.48	
2		-1.13	-10.10	8.97	20.67	380.98		380.89	-7.51	
3		-3.02	-8.87	5.85	23.83	388.39		387.69	-20.46	
4		-2.40	-8.75	6.35	25.47	406.98		406.17	-17.01	
5		-2.73	-9.10	6.37	30.31	432.16		430.74	-20.57	
6		-1.49	-10.58	9.09	35.13	483.67		482.02	-12.55	
7		-0.12	-12.36	12.24	32.79	494.16		492.57	-1.05	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.319		1.005	0.164	-0.146
2		0.320		1.125	0.054	-0.154
3		0.339		1.094	0.102	-0.142
4		0.360		1.099	0.114	-0.098
5		0.391		1.119	0.145	-0.096
6		0.418		1.254	0.102	-0.145
7		0.436		1.217	0.111	-0.146

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.302		1.5230	0.137	0.045		-1.4996		-0.142
2		0.341		1.5440	0.116	0.037		1.2037		-0.149
3		0.347		1.6310	0.143	0.044		2.8012		-0.138
4		0.364		1.7420	0.093	0.027		4.2828		-0.095
5		0.387		1.8800	0.081	0.021		-5.2070		-0.092
6		0.434		2.0510	0.076	0.019		1.9074		-0.138
7		0.443		2.0980	0.069	0.016		4.5678		-0.138

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.983	0.997	0.991	1.000
2	10.0000	0.998	0.997	0.992	1.000
3	30.0000	0.993	0.997	0.989	1.000
4	50.0000	0.993	0.997	0.992	1.000
5	70.0000	0.988	0.996	0.992	1.000
6	90.0000	0.992	0.998	0.991	1.000
7	95.0000	0.985	0.997	0.991	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.0861	0.9887	0.9913
Polytropic Efficiency	=	0.8149	0.9029	------

Percent Design Speed	= 50.1	Discharge Valve Setting	= 30.0
Cor. Nozzle Weight Flow	= 123.15	Vane Schedule	= 0.0
LE Check Flow/Noz.Flow	= 0.9744	TE Check Flow/Noz.Flow	= 0.9900
Assumed LE Flow Coeff.	= 0.955	Assumed TE Flow Coeff.	= 0.935

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 2 READING NUMBER 38 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.34	0.	60.60	5.74	3.04	799.77	742.31	297.47	0.	679.09
2	65.30	0.	59.61	5.69	2.66	786.47	731.43	305.39	0.	664.12
3	62.60	0.	56.01	6.59	2.13	710.69	675.10	310.68	0.	599.36
4	60.11	0.	52.96	7.15	1.71	707.72	616.24	306.83	0.	538.91
5	57.70	0.	49.71	7.99	1.20	699.67	555.20	295.51	0.	467.38
6	55.62	0.	47.11	8.51	0.85	680.49	483.26	269.22	0.	398.53
7	54.55	0.	46.13	8.42	0.52	678.04	463.78	264.28	0.	371.20

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.60	26.34	54.80	3.80	7.74	352.52	605.13	314.90	155.93	515.98
2	58.29	25.78	54.42	3.87	7.02	348.39	595.76	312.89	151.13	506.36
3	54.33	28.41	50.68	3.65	8.27	351.81	530.55	309.35	167.37	430.96
4	48.02	29.45	43.79	4.23	12.09	368.99	480.34	321.24	181.39	357.05
5	37.84	34.66	32.15	5.69	19.85	396.60	413.01	325.44	225.04	252.85
6	23.73	39.42	14.29	9.44	31.89	432.94	366.74	331.35	272.32	145.68
7	16.84	42.00	8.00	8.84	37.72	456.85	357.58	335.27	301.90	101.45

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	679.09	0.270	0.669	1.039	0.263	0.277
2	664.12	0.276	0.660	1.025	0.261	0.295
3	599.36	0.280	0.609	0.996	0.296	0.347
4	533.91	0.278	0.556	1.047	0.308	0.385
5	467.38	0.270	0.501	1.101	0.363	0.412
6	393.53	0.253	0.435	1.231	0.371	0.370
7	371.20	0.250	0.418	1.269	0.374	0.344

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOHEN HEAS RISE/ T RISE	STAT PRESS RISE COEFF
1	671.91	0.312	0.536	1.3340	0.136	0.027	0.7146	0.7184	0.8408	0.239
2	657.49	0.309	0.529	1.3690	0.059	0.011	0.8681	0.8701	0.8569	0.258
3	598.33	0.312	0.471	1.5080	0.040	0.008	0.9189	0.9202	0.8687	0.324
4	538.44	0.328	0.427	1.6840	0.068	0.014	0.8890	0.8907	0.8555	0.380
5	477.89	0.353	0.367	1.9060	0.063	0.013	0.9164	0.9177	0.9079	0.429
6	418.00	0.386	0.327	2.2170	0.068	0.014	0.9340	0.9351	0.9173	0.443
7	403.35	0.407	0.319	2.3390	0.100	0.021	0.9136	0.9151	0.9366	0.450

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.102	1.040	1.096	1.037
2	10.0000	1.102	1.037	1.108	1.034
3	30.0000	1.107	1.037	1.109	1.033
4	50.0000	1.112	1.037	1.112	1.035
5	70.0000	1.119	1.038	1.116	1.037
6	90.0000	1.125	1.040	1.126	1.037
7	95.0000	1.135	1.042	1.129	1.039

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1073	1.1129	1.1126
Adiabatic Efficiency =	0.8463	0.8889	0.8149
Polytropic Efficiency =	0.8485	0.8906	0.8177

Percent Design Speed =	50.0	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	114.70	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0049	TE Check Flow/Noz.Flow =	0.9714
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

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Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 2 READING NUMBER 38 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		26,23	39,47	-13,24		354,15		317,69	156,50	
2		25,39	39,11	-13,72		353,80		319,62	151,68	
3		27,06	39,01	-11,95		367,81		327,37	167,21	
4		27,64	39,80	-12,16		388,05		342,93	179,59	
5		32,46	40,86	-8,40		412,88		346,30	220,29	
6		37,07	42,22	-5,15		446,69		347,49	262,56	
7		39,61	42,76	-3,15		459,65		350,19	289,85	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0,76	-11,13	10,37	26,99	310,15		310,11	-4,12	
2		-1,52	-10,10	8,58	26,91	344,37		344,22	-9,15	
3		-2,35	-8,87	6,52	29,41	349,19		348,75	-14,31	
4		-2,33	-8,75	6,42	29,97	359,54		358,84	-14,61	
5		-2,68	-9,10	6,42	35,14	381,45		380,22	-17,79	
6		-0,65	-10,58	9,93	37,72	418,90		417,58	-4,70	
7		-0,66	-12,36	11,70	40,28	423,97		422,58	-4,90	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,314		0,976	0.273	0.031
2		0,314		1,077	0.174	0.038
3		0,327		1,065	0.202	0.050
4		0,345		1,046	0.216	0.090
5		0,368		1,098	0.228	0.086
6		0,392		1,202	0.194	0.054
7		0,410		1,207	0.228	0.040

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,275		1,5230	0.128	0,042		0.1339		0.030
2		0,306		1,5440	0,096	0,028		0,7643		0,037
3		0,311		1,6310	0,078	0,024		0.5264		0.049
4		0,320		1,7420	0,050	0,014		0,6431		0.087
5		0,340		1,8800	0.034	0,009		0,6009		0.084
6		0,373		2,0510	0.049	0,012		0.5925		0.052
7	-	0,378		2,0980	0,066	0,016		0,7727		0,038

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	3,0000	0,986	0,997	0,991	1,000
2	10,0000	0,999	0,997	0,994	1,000
3	30,0000	0,997	0,996	0,994	1,000
4	50,0000	0,996	0,998	0,996	1,000
5	70,0000	0,995	0,997	0,997	1,000
6	90,0000	0,996	0,997	0,995	1,000
7	95,0000	0,988	0,997	0,993	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.1073	0.9950	0.9950
Polytropic Efficiency	=	0.8485	0.9402	------

Percent Design Speed	= 50.0	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	114.70	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9765	TE Check Flow/Noz.Flow =	0.9724
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

030270

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 3 READING NUMBER 39 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.16	0.	60.60	6.56	3.86	288.26	737.87	286.05	0.	679.23
2	66.35	0.	59.61	6.74	3.71	291.88	725.56	296.86	0.	664.27
3	63.68	0.	56.01	7.67	3.21	296.62	668.86	296.61	0.	599.49
4	61.37	0.	52.56	8.81	2.97	292.42	608.84	291.58	0.	534.02
5	58.79	0.	49.71	9.08	2.29	287.26	548.69	283.28	0.	467.48
6	56.78	0.	47.11	9.67	2.01	288.53	476.49	257.74	0.	393.61
7	59.55	0.	46.13	9.42	1.52	267.96	457.87	254.70	0.	371.28

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.42	31.03	54.80	3.62	8.74	352.96	576.54	301.57	181.42	490.44
2	58.17	30.10	54.42	3.75	8.19	347.88	569.72	300.24	174.04	483.59
3	54.32	31.84	50.68	3.64	9.36	349.94	509.58	297.19	184.58	413.87
4	48.06	33.94	43.79	4.27	13.30	363.52	451.24	301.54	202.92	335.63
5	38.04	37.16	32.15	5.89	20.75	390.25	394.89	310.35	235.19	242.81
6	23.62	42.06	14.29	9.33	33.16	424.00	345.11	312.06	281.60	136.49
7	17.15	42.60	8.00	9.15	38.39	451.74	350.87	328.44	302.05	101.39

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	679.23	0.260	0.665	1.054	0.310	0.308
2	664.27	0.263	0.654	1.032	0.302	0.325
3	599.49	0.267	0.603	1.002	0.330	0.377
4	534.02	0.264	0.549	1.034	0.358	0.415
5	467.48	0.299	0.494	1.096	0.394	0.447
6	393.61	0.242	0.429	1.211	0.412	0.416
7	371.28	0.241	0.412	1.290	0.381	0.396

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	672.06	0.312	0.510	1.3340	0.138	0.027	0.7396	0.7435	0.8613	0.269
2	657.63	0.308	0.505	1.3690	0.070	0.013	0.8609	0.8631	0.8904	0.286
3	598.45	0.310	0.452	1.5080	0.028	0.005	0.9471	0.9480	0.9058	0.354
4	538.55	0.323	0.400	1.6840	0.058	0.012	0.9111	0.9125	0.9022	0.410
5	478.00	0.347	0.351	1.9060	0.034	0.007	0.9558	0.9566	0.9028	0.465
6	418.09	0.377	0.307	2.2170	0.038	0.008	0.9641	0.9648	0.9457	0.492
7	403.43	0.402	0.313	2.3390	0.066	0.013	0.9455	0.9465	0.9186	0.509

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.116	1.046	1.111	1.041
2	10.0000	1.115	1.041	1.118	1.038
3	30.0000	1.118	1.039	1.119	1.035
4	50.0000	1.120	1.039	1.119	1.036
5	70.0000	1.125	1.040	1.122	1.035
6	90.0000	1.130	1.040	1.130	1.037
7	95.0000	1.141	1.043	1.136	1.039

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1166	1.1210	1.1215
Adiabatic Efficiency =	0.8796	0.9115	0.8245
Polytropic Efficiency =	0.8815	0.9130	0.8273

Percent Design Speed = 50.0 Discharge Valve Setting= 11.0
Cor. Nozzle Weight Flow= 109.34 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0106 TE Check Flow/Noz.Flow = 0.9785
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

030270

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 3 READING NUMBER 39 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		30,90	39,47	-8,57		354,56		304,23	182,07	
2		29,67	39,11	-9,44		352,93		306,65	174,67	
3		30,39	39,01	-8,62		364,67		314,39	184,41	
4		31,99	39,80	-7,81		380,07		321,65	200,90	
5		34,90	40,86	-5,96		404,67		330,03	230,22	
6		39,70	42,22	-2,52		429,23		327,09	271,51	
7		40,21	42,76	-2,55		434,08		343,00	289,99	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0,32	-11,13	11,45	30,58	296,71		296,70	1,67	
2		-1,50	-10,10	8,60	31,17	330,91		330,38	-8,65	
3		-1,82	-8,87	7,05	32,21	335,02		334,72	-10,61	
4		-1,81	-8,75	6,94	33,80	338,38		337,83	-10,67	
5		-2,59	-9,10	6,51	37,49	354,43		353,31	-15,97	
6		-0,68	-10,58	9,90	40,37	385,83		384,62	-4,54	
7		-0,70	-12,36	11,66	40,91	393,14		391,84	-4,75	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0,313		0,975	0,330	0,094
2		0,313		1,077	0,231	0,101
3		0,324		1,065	0,245	0,120
4		0,338		1,050	0,269	0,172
5		0,360		1,071	0,265	0,178
6		0,382		1,176	0,255	0,152
7		0,405		1,142	0,286	0,132

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,262		1,5230	0,139	0,046		0,3190		0,092
2		0,293		1,5440	0,062	0,020		0,8420		0,099
3		0,297		1,6310	0,048	0,015		0,7896		0,117
4		0,300		1,7420	0,031	0,009		0,8384		0,168
5		0,315		1,8800	0,027	0,007		0,7793		0,174
6		0,343		2,0510	0,045	0,011		0,8001		0,147
7		0,349		2,0980	0,081	0,019		0,5354		0,128

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,986	0,996	0,991	1,000
2	10,0000	0,999	0,996	0,996	1,000
3	30,0000	0,998	0,995	0,997	1,000
4	50,0000	0,997	0,997	0,998	1,000
5	70,0000	0,995	0,995	0,998	1,000
6	90,0000	0,996	0,997	0,996	1,000
7	95,0000	0,987	0,997	0,991	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DAT/ TRAV. INST.
Total Pressure Ratio	=	1.1166	0.9961	0.9956
Polytropic Efficiency	=	0.8815	0.9655	------

Percent Design Speed	= 50.0	Discharge Valve Setting=	11.0
Cor. Nozzle Weight Flow=	109.34	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9836	TE Check Flow/Noz.Flow =	0.9755
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

031870

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 5 READING NUMBER 49 DATE 3/ 2/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	69.00	0.	60.60	8.40	5.70	262.93	728.94	260.91	0.	679.87
2	68.02	0.	59.61	8.41	5.38	269.27	717.35	268.33	0.	664.89
3	65.66	0.	56.01	9.65	5.19	271.41	658.58	271.40	0.	600.05
4	63.55	0.	52.56	10.99	5.15	266.66	597.35	265.89	0.	534.53
5	61.14	0.	49.71	11.43	4.44	261.49	536.03	257.87	0.	467.92
6	59.19	0.	47.11	12.08	4.42	244.82	463.85	234.98	0.	393.98
7	58.31	0.	46.13	12.16	4.28	241.34	443.11	229.40	0.	371.63

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.14	37.59	54.80	4.34	9.86	548.29	537.29	275.29	211.94	460.75
2	57.63	36.45	54.42	3.21	10.40	354.08	531.32	284.22	209.92	448.33
3	54.60	37.02	50.68	3.92	11.06	347.21	478.52	277.16	209.00	398.02
4	48.45	40.80	43.79	4.66	15.10	357.60	408.15	270.66	237.63	305.43
5	38.32	42.60	32.15	6.17	22.82	380.86	357.44	279.84	257.29	221.15
6	24.10	46.45	14.29	9.81	35.09	408.16	309.78	279.11	293.43	124.45
7	14.67	48.88	8.00	6.67	43.64	440.62	302.91	286.93	328.68	75.13

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	679.87	0.237	0.656	1.055	0.371	0.347
2	664.89	0.242	0.646	1.059	0.366	0.365
3	600.05	0.244	0.593	1.021	0.379	0.416
4	534.53	0.240	0.538	1.018	0.433	0.455
5	467.92	0.235	0.482	1.085	0.460	0.494
6	393.98	0.220	0.417	1.188	0.479	0.483
7	371.63	0.217	0.399	1.251	0.482	0.461

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	672.69	0.307	0.473	1.3340	0.148	0.032	0.7324	0.7370	0.8677	0.306
2	658.25	0.312	0.469	1.3690	0.130	0.025	0.7902	0.7939	0.8915	0.325
3	599.42	0.307	0.423	1.5080	0.053	0.010	0.9147	0.9162	0.9126	0.393
4	539.06	0.316	0.361	1.6840	0.114	0.022	0.8522	0.8547	0.9217	0.451
5	478.45	0.338	0.317	1.9060	0.066	0.014	0.9250	0.9263	0.9455	0.515
6	419.49	0.363	0.276	2.2170	0.055	0.011	0.9530	0.9538	0.9803	0.546
7	403.81	0.392	0.270	2.3390	0.044	0.013	0.9526	0.9536	0.9822	0.578

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.132	1.053	1.129	1.048
2	10.0000	1.135	1.050	1.133	1.046
3	30.0000	1.132	1.044	1.132	1.040
4	50.0000	1.131	1.044	1.128	1.041
5	70.0000	1.134	1.042	1.131	1.039
6	90.0000	1.135	1.040	1.136	1.039
7	95.0000	1.148	1.045	1.144	1.041

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1288	1.1321	1.1340
Adiabatic Efficiency =	0.8504	0.8712	0.8174
Polytropic Efficiency =	0.8530	0.8735	0.8207

Percent Design Speed = 50.1 Discharge Valve Setting= 06.0

Cor. Nozzle Weight Flow= 100.80 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0067 TE Check Flow/Noz.Flow = 0.9773

Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

031870

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 5 READING NUMBER 41 DATE 3/ 2/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		37.45	39.47	-2.02		349.80		277.70	212.70	
2		35.98	39.11	-3.13		358.65		290.24	210.68	
3		35.47	39.01	-3.54		359.97		293.02	208.80	
4		38.73	39.80	-1.07		370.39		288.40	231.30	
5		40.27	40.86	-0.59		391.52		297.27	251.85	
6		44.09	42.22	1.87		410.38		292.30	285.11	
7		46.51	42.76	3.75		438.87		299.39	315.56	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.16	-11.13	10.97	37.61	378.86		278.85	-0.79	
2		-0.56	-10.10	9.54	36.53	387.77		307.74	-2.98	
3		-2.99	-8.87	5.88	38.46	387.49		306.94	-16.03	
4		-1.62	-8.75	7.13	40.35	400.12		299.66	-8.49	
5		-2.55	-9.10	6.55	42.83	412.03		311.06	-13.87	
6		-0.05	-10.58	10.53	44.14	437.94		336.90	-0.30	
7		-1.03	-12.36	11.33	47.53	445.99		344.82	-6.19	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.368		1.004	0.403	0.199
2		0.376		1.060	0.335	0.201
3		0.379		1.048	0.337	0.241
4		0.378		1.039	0.374	0.294
5		0.388		1.046	0.382	0.305
6		0.405		1.153	0.342	0.292
7		0.430		1.152	0.383	0.254

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.245		1.5930	0.129	0.042		0.5524		0.196
2		0.271		1.5440	0.035	0.011		0.7692		0.197
3		0.272		1.6310	0.029	0.009		0.9010		0.236
4		0.265		1.7420	0.017	0.005		0.8616		0.289
5		0.276		1.8800	0.022	0.006		0.8413		0.299
6		0.299		2.0510	0.036	0.009		0.9103		0.285
7		0.306		2.0980	0.092	0.022		0.6745		0.247

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.989	0.996	0.992	1.000
2	10.0000	0.996	0.996	0.996	1.000
3	30.0000	0.998	0.996	0.998	1.000
4	50.0000	0.996	0.997	0.999	1.000
5	70.0000	0.995	0.997	0.998	1.000
6	90.0000	0.997	0.999	0.997	1.000
7	95.0000	0.987	0.998	0.991	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.1288	0.9971	0.9955
Polytropic Efficiency	=	0.8530	0.9765	------
Percent Design Speed	= 50.1	Discharge Valve Setting=		06.0
Cor. Nozzle Weight Flow=	100.80	Vane Schedule	=	0.0
LE Check Flow/Noz.Flow =	0.9824	TE Check Flow/Noz.Flow =		0.9688
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =		0.935

030270

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 6 READING NUMBER 42 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	71.58	0.	60.60	10.98	8.28	228.10	717.06	226.36	0.	679.81
2	70.64	0.	59.61	11.03	8.00	234.43	704.95	233.61	0.	664.83
3	68.43	0.	56.01	12.42	7.96	237.21	645.19	237.20	0.	600.00
4	66.39	0.	52.56	13.83	7.99	234.33	583.59	233.65	0.	534.48
5	63.89	0.	49.71	14.18	7.39	232.50	522.46	229.28	0.	467.88
6	61.63	0.	47.11	14.52	6.86	221.63	452.01	212.72	0.	393.94
7	60.65	0.	46.13	14.52	6.62	219.86	431.76	208.98	0.	371.59

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.42	51.30	54.80	5.62	11.16	357.97	453.12	223.46	278.95	393.68
2	57.14	43.15	54.42	2.72	13.50	363.57	488.50	264.79	248.23	409.96
3	54.87	43.02	50.68	4.19	13.56	348.02	442.13	254.39	237.41	361.55
4	49.11	47.64	43.79	5.32	17.28	355.36	365.73	239.40	262.57	276.44
5	38.96	47.17	32.15	6.81	24.93	373.44	326.68	253.49	273.41	204.99
6	25.91	48.80	14.29	11.62	35.72	392.86	289.38	257.01	293.58	124.87
7	15.34	50.75	8.00	7.34	45.31	429.85	285.36	269.49	329.85	73.92

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	679.81	0.205	0.645	0.987	0.513	0.365
2	664.83	0.211	0.634	1.133	0.435	0.380
3	600.00	0.213	0.580	1.072	0.437	0.438
4	534.48	0.211	0.525	1.025	0.507	0.477
5	467.88	0.209	0.470	1.106	0.513	0.532
6	393.94	0.199	0.406	1.208	0.510	0.558
7	371.59	0.198	0.388	1.290	0.510	0.554

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	672.63	0.313	0.397	1.3340	0.215	0.040	0.7091	0.7147	0.9049	0.323
2	658.19	0.319	0.429	1.3690	0.199	0.040	0.7330	0.7382	0.8707	0.340
3	598.96	0.307	0.390	1.5080	0.104	0.020	0.8583	0.8610	0.9181	0.415
4	539.01	0.313	0.323	1.6840	0.164	0.032	0.8151	0.8184	0.8973	0.474
5	478.40	0.330	0.289	1.9060	0.086	0.017	0.9137	0.9153	0.8960	0.556
6	418.45	0.348	0.257	2.2170	0.050	0.010	0.9603	0.9610	0.8928	0.646
7	403.78	0.382	0.253	2.3390	0.091	0.019	0.9378	0.9391	0.9093	0.680

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.148	1.067	1.146	1.056
2	10.0000	1.150	1.060	1.147	1.055
3	30.0000	1.144	1.050	1.142	1.045
4	50.0000	1.140	1.051	1.136	1.046
5	70.0000	1.141	1.047	1.138	1.041
6	90.0000	1.140	1.044	1.141	1.040
7	95.0000	1.156	1.047	1.147	1.043

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1369	1.1416	1.1444
Adiabatic Efficiency =	0.8065	0.8333	0.7614
Polytropic Efficiency =	0.8101	0.8365	0.7659

Percent Design Speed =	50.1	Discharge Valve Setting=	02.0
Cor. Nozzle Weight Flow=	89.28	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0084	TE Check Flow/Noz.Flow =	1.0000
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 6 READING NUMBER 42 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		51.16	39,47	11,69		359,41		225,38	279,95	
2		42,66	39,11	3,55		367,65		270,35	249,13	
3		41,43	39,01	2,42		358,61		268,78	237,18	
4		45,57	39,80	5,77		364,39		254,85	259,96	
5		44,85	40,86	3,99		381,11		269,06	267,63	
6		46,46	42,22	4,24		393,55		269,02	283,06	
7		48,41	42,76	5,65		426,96		281,10	316,69	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		3,20	=11,13	14,33	47,96	268,47		268,05	14,99	
2		1,67	=10,10	11,77	40,99	285,00		284,86	8,30	
3		=1,46	=8,87	7,41	42,89	278,31		278,10	-7,11	
4		=0,14	=8,75	8,61	45,71	258,30		258,02	-0,64	
5		=0,90	=9,10	8,20	45,75	271,64		271,03	-4,27	
6		1,82	=10,58	12,40	44,64	291,45		290,61	9,23	
7		=0,78	=12,36	11,58	49,18	299,69		298,70	-4,04	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1		0,315		1,189	0,495	0,288
2		0,323		1,054	0,437	0,288
3		0,316		1,035	0,432	0,335
4		0,322		1,012	0,495	0,406
5		0,337		1,007	0,475	0,416
6		0,349		1,079	0,426	0,405
7		0,379		1,063	0,474	0,345

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,235		1,5230	0,121	0,040		0,6606		0,283
2		0,250		1,5440	0,070	0,023		0,7298		0,283
3		0,245		1,6310	0,034	0,010		0,8480		0,329
4		0,227		1,7420	0,052	0,015		0,8198		0,400
5		0,240		1,8800	0,045	0,012		0,8516		0,409
6		0,258		2,0510	0,049	0,012		0,9017		0,398
7		0,265		2,0980	0,086	0,021		0,6854		0,337

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,990	0,990	0,992	1,000
2	10,0000	0,992	0,995	0,995	1,000
3	30,0000	0,996	0,996	0,998	1,000
4	50,0000	0,994	0,995	0,996	1,000
5	70,0000	0,994	0,995	0,997	1,000
6	90,0000	0,996	0,996	0,996	1,000
7	95,0000	0,984	0,996	0,992	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.1369	0.9959	0.9934
Polytropic Efficiency =	0.8101	0.9684	------

Percent Design Speed = 50.1 Discharge Valve Setting= 02.0
Cor. Nozzle Weight Flow= 89.28 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0052 TE Check Flow/Noz.Flow = 0.9857
Assumed LE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

Blade Element Data For Undistorted Inlet Testing (Continued)

030270

ROTOR BLADE ROW = NASA TASK I.

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 43 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.05	0.	60.60	3.45	0.75	466.94	1060.46	463.36	0.	952.13
2	63.08	0.	59.61	3.47	0.44	474.39	1045.03	472.73	0.	931.15
3	60.10	0.	56.01	4.09	-0.37	483.21	969.37	483.20	0.	840.35
4	57.54	0.	52.56	4.98	-0.86	477.57	887.94	476.19	0.	748.58
5	54.91	0.	49.71	5.20	-1.59	466.81	804.57	460.34	0.	655.30
6	52.82	0.	47.11	5.71	-1.95	436.08	703.27	418.55	0.	551.75
7	51.68	0.	46.13	5.55	-2.39	432.72	676.83	411.30	0.	520.44

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.32	19.84	54.80	4.52	4.72	491.06	903.20	460.31	166.05	776.02
2	58.47	20.16	54.42	4.05	4.61	493.10	883.44	461.57	169.49	752.35
3	54.47	21.68	50.68	3.79	5.63	501.65	801.18	465.56	186.98	651.92
4	48.36	25.48	43.79	4.57	9.18	522.36	709.63	471.46	224.66	530.27
5	38.27	29.49	32.15	6.12	16.64	569.78	631.40	494.65	279.79	390.25
6	24.59	35.82	14.29	10.30	28.22	619.13	553.54	496.85	358.65	227.42
7	17.81	38.81	8.00	9.81	33.88	653.80	538.60	502.52	404.13	161.39

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	952.13	0.426	0.966	0.993	0.207	0.224
2	931.15	0.433	0.953	0.976	0.214	0.243
3	840.35	0.441	0.885	0.964	0.237	0.301
4	748.58	0.436	0.810	0.990	0.276	0.338
5	655.30	0.425	0.733	1.075	0.307	0.365
6	551.75	0.396	0.639	1.187	0.331	0.319
7	520.44	0.393	0.615	1.222	0.337	0.291

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ HEAT RISE	STAT PRESS RISE COEFF
1	942.07	0.436	0.802	1.3340	0.099	0.019	0.7221	0.7269	0.8943	0.173
2	921.84	0.438	0.785	1.3690	0.047	0.009	0.8769	0.8795	0.9468	0.192
3	838.89	0.445	0.711	1.5080	0.023	0.004	0.9476	0.9489	0.8720	0.261
4	754.92	0.464	0.630	1.6840	0.064	0.013	0.8837	0.8866	0.9209	0.316
5	670.04	0.507	0.562	1.9060	0.041	0.009	0.9360	0.9377	0.9238	0.365
6	586.07	0.592	0.493	2.2170	0.074	0.015	0.9194	0.9218	0.9543	0.374
7	569.52	0.584	0.481	2.3390	0.120	0.024	0.8860	0.8895	0.9921	0.376

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.149	1.056	1.130	1.049
2	10.0000	1.156	1.053	1.166	1.051
3	30.0000	1.177	1.058	1.182	1.052
4	50.0000	1.191	1.063	1.194	1.059
5	70.0000	1.217	1.075	1.205	1.069
6	90.0000	1.235	1.071	1.231	1.067
7	99.0000	1.296	1.074	1.240	1.072

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1674	1.1910	1.1924
Adiabatic Efficiency =	0.7937	0.8989	0.8462
Polytropic Efficiency =	0.7982	0.9014	0.850

Percent Design Speed = 70.1 Discharge Valve Setting= 30.0
Cor. Nozzle Weight Flow= 169.98 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9994 TE Check Flow/Noz.Flow = 0.9682
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 43 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		19.73	39,47	-19,74		493,62		464,64	166,65	
2		19,80	39,11	-19,31		502,16		472,44	170,10	
3		20,63	39,01	-18,38		530,55		496,22	186,80	
4		23,66	39,80	-16,14		555,68		507,66	222,42	
5		27,25	40,86	-13,61		602,18		931,84	273,87	
6		33,37	42,22	-8,85		639,87		525,03	345,80	
7		36,29	42,76	-6,47		663,53		528,37	388,00	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0,87	-11,13	10,26	20,60	472,49		472,43	-7,19	
2		-0,84	-10,10	9,26	20,64	539,42		539,33	-7,90	
3		-2,99	-8,87	5,88	23,62	547,97		547,00	-28,58	
4		-1,49	-8,75	7,26	25,15	572,05		571,23	-14,88	
5		-3,10	-9,10	6,00	30,35	598,33		598,18	-32,32	
6		-0,95	-10,58	9,63	34,32	668,96		666,81	-11,03	
7		-0,40	-12,36	11,96	36,69	692,81		690,57	-4,77	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.438		1,017	0,158	-0,212
2		0,447		1,142	0,040	-0,203
3		0,472		1,102	0,091	-0,193
4		0,495		1,125	0,092	-0,152
5		0,537		1,121	0,141	-0,142
6		0,568		1,270	0,082	-0,213
7		0,593		1,307	0,094	-0,229

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,420		1,5230	0,177	0,058		-2,7356		-0,200
2		0,482		1,5440	0,117	0,038		1,3025		-0,191
3		0,490		1,6310	0,167	0,051		2,6527		-0,180
4		0,511		1,7420	0,119	0,034		2,5363		-0,142
5		0,535		1,8800	0,109	0,029		-22,3844		-0,131
6		0,600		2,0510	0,102	0,025		1,9248		-0,193
7		0,622		2,0980	0,095	0,023		2,4786		-0,205

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,962	0,994	0,978	1,000
2	10,0000	0,993	0,998	0,985	1,000
3	30,0000	0,981	0,994	0,977	1,000
4	50,0000	0,984	1,000	0,982	1,000
5	70,0000	0,970	0,994	0,980	1,000
6	90,0000	0,977	0,996	0,980	1,000
7	95,0000	0,967	0,998	0,980	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.1674	0.9802	0.9787
Polytropic Efficiency	=	0.7982	0.8829	------

Percent Design Speed =	70.1	Discharge Valve Setting=	30.0
Cor. Nozzle Weight Flow=	169.98	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9733	TE Check Flow/Noz.Flow =	0.9871
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

930270

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 8 READING NUMBER 44 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.26	0.	60.60	4.66	1.96	441.73	1048.97	438.35	0.	951.42
2	64.24	0.	59.61	4.63	1.60	450.53	1033.80	448.95	0.	930.46
3	61.48	0.	56.01	5.47	1.01	456.24	955.66	456.23	0.	839.72
4	59.12	0.	52.56	6.56	0.72	448.59	872.22	447.30	0.	748.02
5	56.68	0.	49.71	6.97	0.18	436.46	786.94	430.41	0.	654.81
6	54.56	0.	47.11	7.45	-0.21	408.88	686.41	392.45	0.	551.34
7	53.23	0.	46.13	7.10	-0.80	408.81	661.50	388.58	0.	520.06

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.53	27.38	54.80	3.73	6.74	494.29	838.96	437.54	226.61	714.76
2	57.98	27.25	54.42	3.56	6.26	491.32	822.51	439.68	224.40	696.76
3	54.14	28.82	50.68	3.46	7.35	494.96	740.16	433.56	238.50	599.77
4	48.24	31.36	43.79	4.45	10.88	510.85	655.02	436.16	265.78	488.59
5	38.03	34.90	32.15	5.88	18.65	552.93	575.63	452.42	315.64	353.90
6	24.06	40.74	14.29	9.77	30.50	596.35	496.83	447.77	385.70	199.93
7	16.76	43.25	8.00	8.76	36.47	632.34	485.18	459.08	428.06	137.04

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	951.42	0.402	0.954	0.998	0.281	0.299
2	930.46	0.410	0.941	0.970	0.283	0.318
3	839.72	0.419	0.870	0.950	0.308	0.375
4	748.02	0.408	0.794	0.975	0.340	0.413
5	654.81	0.397	0.715	1.051	0.375	0.444
6	551.34	0.371	0.623	1.141	0.406	0.415
7	520.06	0.371	0.600	1.171	0.411	0.398

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	941.37	0.435	0.738	1.3340	0.101	0.020	0.7936	0.7989	0.9031	0.240
2	921.16	0.433	0.725	1.3690	0.093	0.010	0.8918	0.8949	0.9566	0.260
3	838.27	0.437	0.653	1.5080	0.015	0.003	0.9717	0.9726	0.9325	0.332
4	754.36	0.451	0.579	1.6840	0.048	0.010	0.9246	0.9269	0.9301	0.390
5	669.54	0.490	0.510	1.9060	0.020	0.004	0.9722	0.9730	0.9606	0.446
6	585.64	0.529	0.441	2.2170	0.045	0.009	0.9563	0.9549	0.9514	0.475
7	565.10	0.562	0.431	2.3390	0.092	0.019	0.9192	0.9219	0.9789	0.488

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.214	1.076	1.201	1.068
2	10.0000	1.216	1.070	1.222	1.066
3	30.0000	1.227	1.069	1.229	1.063
4	50.0000	1.231	1.069	1.231	1.066
5	70.0000	1.249	1.071	1.235	1.064
6	90.0000	1.256	1.076	1.251	1.069
7	95.0000	1.279	1.080	1.259	1.074

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.2193	1.2311	1.235
Adiabatic Efficiency =	0.8858	0.9304	0.8714
Polytropic Efficiency =	0.8890	0.9325	0.8735

Percent Design Speed =	70.1	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	160.99	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0042	TE Check Flow/Noz.Flow =	0.9765
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

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Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 6 READING NUMBER 44 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		27.25	39.47	-12.22		496.72		441.60	227.43	
2		26.81	39.11	-12.30		499.42		445.73	225.21	
3		27.32	39.01	-11.69		519.42		461.21	238.27	
4		29.33	39.80	-10.47		538.52		468.41	263.13	
5		32.51	40.86	-8.35		578.29		484.77	308.97	
6		38.24	42.22	-3.98		606.87		471.86	371.88	
7		40.72	42.76	-2.04		636.74		477.42	410.98	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-1.32	-11.13	9.81	28.57	432.22		432.10	-9.97	
2		-1.30	-10.10	8.80	28.11	480.48		480.33	-10.90	
3		-2.05	-8.87	6.82	29.37	487.57		487.06	-17.42	
4		-2.01	-8.75	6.74	31.34	495.76		494.91	-17.40	
5		-2.80	-9.10	6.30	35.31	520.70		518.97	-25.37	
6		-1.33	-10.58	9.25	39.57	567.54		565.64	-13.14	
7		-0.06	-12.36	12.30	40.78	579.85		577.98	-0.57	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CR1
1		0.437		0.979	0.287	0.036
2		0.441		1.078	0.191	0.040
3		0.459		1.056	0.212	0.051
4		0.477		1.057	0.228	0.093
5		0.513		1.071	0.252	0.092
6		0.539		1.199	0.217	0.050
7		0.566		1.211	0.240	0.034

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.380		1.5230	0.128	0.042		0.1533		0.035
2		0.424		1.5440	0.070	0.023		0.5574		0.038
3		0.431		1.6310	0.079	0.024		0.4512		0.049
4		0.438		1.7420	0.061	0.018		0.6175		0.088
5		0.461		1.8800	0.035	0.009		0.4987		0.086
6		0.504		2.0510	0.055	0.013		0.4212		0.047
7		0.514		2.0980	0.071	0.017		0.2062		0.032

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.974	0.992	0.984	1.000
2	10.0000	0.996	0.997	0.991	1.000
3	30.0000	0.991	0.994	0.989	1.000
4	50.0000	0.991	0.997	0.991	1.000
5	70.0000	0.983	0.994	0.994	1.000
6	90.0000	0.986	0.994	0.990	1.000
7	95.0000	0.971	0.995	0.986	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2193	0.9904	0.9871
Polytropic Efficiency	=	0.8890	0.9534	------

Percent Design Speed =	70.1	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	160.99	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9816	TE Check Flow/Noz.Flow =	0.9772
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

Blade Element Data For Undistorted Inlet Testing (Continued)

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ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 45 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.03	0.	60.60	6.43	3.73	405.90	1033.35	402.79	0.	950.30
2	65.81	0.	59.61	6.20	3.17	418.87	1019.39	417.40	0.	929.36
3	63.34	0.	56.01	7.33	2.87	421.15	938.53	421.14	0.	838.73
4	61.22	0.	52.56	8.66	2.82	411.54	852.99	410.36	0.	747.14
5	58.85	0.	49.71	9.14	2.35	400.91	767.14	395.35	0.	654.04
6	56.83	0.	47.11	9.72	2.06	374.97	666.23	359.90	0.	550.69
7	55.53	0.	46.13	9.40	1.50	375.15	640.75	356.58	0.	519.44

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.15	34.66	54.80	3.35	8.88	498.16	775.16	408.64	282.57	657.69
2	57.64	33.65	54.42	3.22	8.16	493.74	766.81	410.09	272.98	647.09
3	54.15	34.81	50.68	3.47	9.19	490.61	687.66	402.73	280.00	557.29
4	48.77	37.94	43.79	4.98	12.45	497.71	598.76	394.59	303.21	450.26
5	39.13	39.98	32.15	6.98	19.72	529.33	522.95	404.80	339.39	329.36
6	25.20	44.24	14.29	10.91	31.63	569.85	453.34	404.96	394.37	190.58
7	16.50	46.98	8.00	8.50	39.03	611.28	439.39	412.67	442.20	122.24

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	950.30	0.368	0.938	1.015	0.352	0.352
2	929.36	0.380	0.926	0.982	0.345	0.372
3	838.73	0.382	0.852	0.956	0.366	0.429
4	747.14	0.374	0.774	0.962	0.404	0.468
5	654.04	0.364	0.696	1.024	0.435	0.505
6	550.69	0.340	0.603	1.125	0.456	0.495
7	519.44	0.340	0.580	1.157	0.468	0.484

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOWEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	940.26	0.435	0.677	1.3340	0.117	0.023	0.8069	0.8131	0.9462	0.290
2	920.07	0.432	0.670	1.3690	0.086	0.017	0.8590	0.8637	0.9182	0.311
3	837.28	0.430	0.603	1.5080	0.028	0.006	0.9545	0.9560	0.9253	0.386
4	753.47	0.437	0.526	1.6840	0.068	0.013	0.9080	0.9110	0.9269	0.446
5	668.75	0.466	0.460	1.9060	0.038	0.008	0.9559	0.9574	0.9198	0.510
6	584.94	0.503	0.400	2.2170	0.045	0.009	0.9592	0.9605	0.9230	0.561
7	564.43	0.541	0.389	2.3390	0.063	0.013	0.9495	0.9512	0.9633	0.583

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.267	1.090	1.256	1.084
2	10.0000	1.265	1.088	1.267	1.082
3	30.0000	1.267	1.082	1.264	1.073
4	50.0000	1.260	1.079	1.256	1.074
5	70.0000	1.266	1.079	1.260	1.072
6	90.0000	1.270	1.080	1.267	1.073
7	95.0000	1.295	1.083	1.279	1.077

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.2548	1.2628	1.2671
Adiabatic Efficiency =	0.8909	0.9166	0.8505
Polytropic Efficiency =	0.8944	0.9193	0.8554

Percent Design Speed = 70.0 Discharge Valve Setting= 09.0
Cor. Nozzle Weight Flow= 151.55 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9944 TE Check Flow/Noz.Flow = 0.9712
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

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Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 45 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		34.52	39.47	-4.95		500.47		412.37	283.59	
2		33.16	39.11	-5.95		500.94		419.36	273.97	
3		33.19	39.01	-5.82		511.30		427.69	279.73	
4		35.38	39.80	-4.42		519.48		422.65	300.20	
5		37.54	40.86	-3.32		548.18		432.41	332.22	
6		41.76	42.22	-0.46		576.18		425.93	380.23	
7		44.49	42.76	1.73		611.67		432.25	424.55	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.19	=11.13	10.94	34.71	407.02		407.01	-1.38	
2		-0.92	=10.10	9.18	34.08	451.89		451.81	-7.25	
3		-2.62	=8.87	6.25	35.81	446.82		446.17	=20.43	
4		-2.20	=8.75	6.55	37.98	439.84		439.03	=16.84	
5		-2.14	=9.10	6.96	39.68	455.82		454.53	=17.02	
6		-1.07	=10.58	9.51	42.82	487.89		486.30	-9.06	
7		-0.45	=12.36	11.91	44.94	501.72		500.09	-3.96	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.437		0.987	0.374	0.137
2		0.438		1.077	0.279	0.155
3		0.449		1.043	0.306	0.177
4		0.457		1.039	0.327	0.233
5		0.483		1.051	0.336	0.250
6		0.509		1.142	0.315	0.229
7		0.541		1.157	0.343	0.196

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.354		1.5230	0.138	0.045		0.4120		0.132
2		0.395		1.5440	0.041	0.013		0.8529		0.148
3		0.392		1.6310	0.037	0.011		0.7690		0.169
4		0.386		1.7420	0.024	0.007		0.8356		0.224
5		0.400		1.8800	0.032	0.008		0.8238		0.239
6		0.429		2.0510	0.044	0.011		0.8243		0.218
7		0.441		2.0980	0.073	0.017		0.6088		0.185

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.974	0.994	0.983	1.000
2	10.0000	0.996	0.994	0.995	1.000
3	30.0000	0.993	0.992	0.995	1.000
4	50.0000	0.993	0.995	0.997	1.000
5	70.0000	0.991	0.993	0.995	1.000
6	90.0000	0.991	0.993	0.993	1.000
7	95.0000	0.975	0.994	0.987	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2548	0.9937	0.9904
Polytropic Efficiency	=	0.8944	0.9729	------

Percent Design Speed =	70.0	Discharge Valve Setting=	09.0
Cor. Nozzle Weight Flow=	151.55	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9763	TE Check Flow/Noz.Flow =	0.9721
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 46 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	68.30	0.	60.60	7.70	5.00	381.36	1024.55	378.43	0.	950.93
2	67.40	0.	59.61	7.79	4.76	388.56	1007.89	387.20	0.	929.98
3	65.06	0.	56.01	9.05	4.59	390.32	925.61	390.31	0.	839.29
4	63.12	0.	52.56	10.56	4.72	380.05	838.69	378.95	0.	747.64
5	60.84	0.	49.71	11.13	4.34	370.26	751.95	365.13	0.	654.48
6	58.70	0.	47.11	11.59	3.93	349.13	652.34	335.10	0.	551.06
7	57.40	0.	46.13	11.27	3.37	349.70	626.47	332.39	0.	519.79

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.35	38.98	54.80	3.55	9.95	498.99	738.27	386.99	313.11	627.77
2	57.38	37.76	54.42	2.96	10.01	499.26	731.53	393.92	305.09	619.59
3	54.62	39.22	50.68	3.94	10.44	486.28	650.63	376.66	307.41	530.43
4	48.71	42.39	43.79	4.92	14.42	497.73	557.06	367.57	335.49	418.49
5	39.53	43.94	32.15	7.38	21.31	520.44	486.02	374.10	360.48	308.71
6	26.15	46.95	14.29	11.86	32.55	553.18	422.93	374.88	401.27	184.06
7	16.10	49.43	8.00	8.10	41.30	601.98	412.07	387.77	452.89	111.92

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	950.93	0.345	0.928	1.023	0.393	0.375
2	929.98	0.352	0.913	1.017	0.384	0.392
3	839.29	0.354	0.839	0.965	0.407	0.446
4	747.64	0.344	0.760	0.970	0.455	0.488
5	654.48	0.335	0.681	1.025	0.480	0.532
6	551.06	0.316	0.590	1.119	0.494	0.546
7	519.79	0.316	0.565	1.167	0.504	0.541

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	940.88	0.434	0.642	1.3340	0.161	0.032	0.7686	0.7767	0.9395	0.312
2	920.68	0.435	0.637	1.3690	0.133	0.026	0.8101	0.8169	0.9268	0.330
3	837.84	0.425	0.568	1.5090	0.077	0.015	0.8910	0.8948	0.9381	0.403
4	753.97	0.435	0.487	1.6840	0.121	0.024	0.8546	0.8594	0.9177	0.467
5	669.20	0.497	0.427	1.9060	0.077	0.016	0.9186	0.9213	0.9324	0.540
6	585.33	0.487	0.373	2.2170	0.073	0.015	0.9404	0.9424	0.9185	0.618
7	564.81	0.532	0.364	2.3390	0.107	0.022	0.9215	0.9242	0.9566	0.648

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.292	1.101	1.285	1.097
2	10.0000	1.293	1.098	1.294	1.095
3	30.0000	1.283	1.088	1.280	1.082
4	50.0000	1.278	1.089	1.268	1.092
5	70.0000	1.277	1.083	1.271	1.077
6	90.0000	1.278	1.082	1.278	1.078
7	95.0000	1.310	1.086	1.286	1.081

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.2712	1.2788	1.2844
Adiabatic Efficiency =	0.8465	0.8692	0.8319
Polytropic Efficiency =	0.8517	0.8728	0.8377

Percent Design Speed = 70.0 Discharge Valve Setting= 06.0

Cor. Nozzle Weight Flow= 141.97 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9941 TE Check Flow/Noz.Flow = 0.9805

Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 46 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		38,83	39,47	-0,64		501,23		390,48	314,24	
2		37,25	39,11	-1,86		505,91		402,70	306,20	
3		37,55	39,01	-1,46		504,14		399,51	307,11	
4		40,19	39,80	0,39		515,60		393,14	332,15	
5		41,49	40,86	0,63		535,12		398,95	352,86	
6		44,49	42,22	2,27		556,69		393,82	386,89	
7		46,97	42,76	4,21		600,00		405,85	434,82	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0,24	=11,13	11,37	38,58	389,00		389,00	1,65	
2		0,25	=10,10	10,35	36,99	434,40		434,37	1,93	
3		-2,57	=8,87	6,30	40,12	415,90		415,31	=18,65	
4		-1,24	=8,75	7,51	41,43	398,09		397,55	-8,62	
5		-1,81	=9,10	7,29	43,30	411,87		410,78	=12,99	
6		0,57	=10,58	11,15	43,92	442,58		441,19	4,39	
7		-0,55	=12,36	11,81	47,52	446,08		444,62	-4,24	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,436		0,996	0,429	0,214
2		0,441		1,079	0,336	0,227
3		0,441		1,040	0,373	0,269
4		0,451		1,011	0,416	0,326
5		0,470		1,030	0,410	0,346
6		0,491		1,120	0,369	0,326
7		0,530		1,096	0,428	0,281

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,336		1,5230	0,148	0,048		0,5433		0,206
2		0,377		1,5440	0,044	0,014		0,8728		0,219
3		0,363		1,6310	0,030	0,009		0,8521		0,259
4		0,347		1,7420	0,023	0,007		0,8148		0,315
5		0,360		1,8800	0,026	0,007		0,8566		0,334
6		0,387		2,0510	0,043	0,010		0,8950		0,313
7		0,390		2,0980	0,073	0,017		0,6345		0,267

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,976	0,996	0,982	1,000
2	10,0000	0,996	0,997	0,995	1,000
3	30,0000	0,994	0,994	0,996	1,000
4	50,0000	0,990	0,994	0,997	1,000
5	70,0000	0,991	0,995	0,996	1,000
6	90,0000	0,994	0,996	0,994	1,000
7	95,0000	0,969	0,995	0,987	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.2712	0.9941	0.9899
Polytropic Efficiency =	0:8517	0.9758	------

Percent Design Speed = 70.0 Discharge Valve Setting= 06.0
Cor. Nozzle Weight Flow= 141.97 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9856 TE Check Flow/Noz.Flow = 0.9746
Assumed LE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

030320

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 11 READING NUMBER 47 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	70.33	0.	60.50	9.78	7.03	342.90	1011.68	340.27	0.	951.80
2	69.42	0.	59.61	9.81	6.78	356.77	994.73	349.54	0.	936.83
3	67.35	0.	56.01	11.34	6.83	350.51	918.25	350.50	0.	840.06
4	65.32	0.	52.56	12.76	6.92	364.85	823.96	343.86	0.	748.32
5	62.77	0.	49.71	13.06	6.97	341.81	738.49	337.07	0.	659.08
6	60.62	0.	47.11	13.51	5.85	323.50	639.43	310.50	0.	551.56
7	59.77	0.	46.13	13.64	5.74	318.94	610.25	303.16	0.	520.26

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.17	45.86	54.90	4.27	11.19	500.69	679.75	347.99	358.65	583.09
2	57.05	43.92	54.42	2.43	12.37	511.38	676.81	367.75	354.11	567.41
3	55.35	43.67	50.68	4.67	12.09	487.87	614.22	349.19	333.39	505.22
4	49.08	46.24	43.79	5.29	16.24	498.43	506.79	331.91	371.76	382.90
5	39.76	46.77	32.15	7.61	28.01	514.68	460.96	353.32	379.85	293.96
6	27.27	48.50	14.29	12.98	38.36	580.98	485.45	355.96	402.41	183.46
7	15.80	52.80	8.00	7.80	48.97	592.60	383.85	361.73	462.94	102.39

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	951.80	0.310	0.914	1.023	0.460	0.382
2	930.83	0.317	0.899	1.052	0.449	0.397
3	840.06	0.317	0.828	0.996	0.447	0.453
4	748.32	0.312	0.745	0.965	0.519	0.491
5	659.08	0.309	0.648	1.048	0.511	0.553
6	551.56	0.292	0.577	1.146	0.512	0.587
7	520.26	0.288	0.551	1.193	0.540	0.584

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	WHEEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	941.74	0.432	0.587	1.3340	0.231	0.044	0.7088	0.7194	0.9436	0.319
2	921.53	0.443	0.586	1.3698	0.247	0.041	0.7401	0.7498	0.9350	0.336
3	836.41	0.420	0.538	1.5080	0.141	0.027	0.8254	0.8317	0.9354	0.411
4	754.66	0.434	0.441	1.6648	0.168	0.033	0.8172	0.8235	0.9275	0.473
5	669.81	0.453	0.403	1.9040	0.171	0.024	0.8841	0.8881	0.9236	0.563
6	565.87	0.476	0.356	2.2178	0.078	0.010	0.9397	0.9419	0.9027	0.665
7	565.33	0.522	0.336	2.3390	0.043	0.017	0.9427	0.9448	0.9554	0.700

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.308	1.115	1.301	1.111
2	10.0000	1.315	1.112	1.306	1.107
3	30.0000	1.296	1.096	1.292	1.092
4	50.0000	1.288	1.097	1.279	1.089
5	70.0000	1.289	1.088	1.283	1.084
6	90.0000	1.286	1.084	1.286	1.080
7	95.0000	1.320	1.088	1.298	1.082

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2809	1.2910	1.2974
Adiabatic Efficiency	=	0.7950	0.8212	0.7955
Polytropic Efficiency	=	0.8021	0.8276	0.8030

Percent Design Speed =	70.10	Discharge Valve Setting=	03.0
Cor. Nozzle Weight Flow=	128.91	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0051	TE Check Flow/Noz.Flow =	1.0044
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 3 NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 11 READING NUMBER 47 DATE 3/ 1X1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		46,71	39,47	6,24		502,81		351,07	359,95	
2		43,40	39,11	4,29		517,27		375,83	355,40	
3		42,00	39,01	2,99		498,80		369,97	333,07	
4		46,08	39,80	6,28		511,74		354,44	368,07	
5		44,34	40,86	3,48		528,63		376,44	367,91	
6		46,07	42,22	3,85		542,96		373,71	387,98	
7		49,60	42,76	6,84		583,29		378,32	444,47	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1,64	=11,13	12,77	44,07	371,06		370,90	10,65	
2		1,44	=10,10	11,54	41,76	403,88		403,69	11,58	
3		=0,83	=9,87	8,04	42,82	385,80		384,80	=5,56	
4		0,46	=8,75	9,21	45,62	358,09		357,68	=2,86	
5		=1,43	=9,10	7,67	45,77	374,13		373,21	=9,30	
6		2,05	=10,53	12,63	44,02	395,54		394,07	14,12	
7		=1,35	=12,36	11,01	50,95	406,77		405,35	=9,55	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,434		1,056	0,490	0,283
2		0,448		1,074	0,434	0,284
3		0,434		1,040	0,435	0,343
4		0,446		1,069	0,504	0,410
5		0,463		0,991	0,480	0,422
6		0,477		1,054	0,436	0,415
7		0,518		1,071	0,489	0,347

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,318		1,5230	0,138	0,045		0,6272		0,274
2		0,348		1,5440	0,061	0,020		0,7353		0,274
3		0,333		1,6310	0,039	0,012		0,8575		0,332
4		0,310		1,7420	0,047	0,014		0,8117		0,399
5		0,325		1,8830	0,047	0,012		0,8497		0,409
6		0,345		2,0510	0,057	0,014		0,8908		0,402
7		0,354		2,0980	0,089	0,021		0,6725		0,833

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,978	0,996	0,983	1,000
2	10,0000	0,986	0,996	0,992	1,000
3	30,0000	0,993	0,997	0,995	1,000
4	50,0000	0,997	0,993	0,994	1,000
5	70,0000	0,999	0,996	0,996	1,000
6	90,0000	0,992	0,996	0,992	1,000
7	95,0000	0,969	0,995	0,985	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.2809	0.9922	0.9871
Polytropic Efficiency =	0.8021	0.9692	-------

Percent Design Speed = 70.1 Discharge Valve Setting= 03.0
Cor. Nozzle Weight Flow= 128.91 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0097 TE Check Flow/Noz.Flow = 0.9945
Assumed LE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 12 READING NUMBER 48 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.18	0.	60.60	3.58	0.88	530.51	1210.31	524.44	0.	1087.85
2	63.05	0.	59.61	3.44	0.41	542.81	1194.35	540.90	0.	1063.88
3	60.14	0.	56.01	4.13	-0.33	551.19	1107.10	551.17	0.	960.13
4	57.53	0.	52.56	4.97	-0.87	545.91	1014.66	544.34	0.	855.28
5	55.02	0.	49.71	5.31	-1.48	531.19	918.00	523.83	0.	748.71
6	53.07	0.	47.11	5.96	-1.70	493.93	808.73	473.89	0.	630.40
7	51.97	0.	46.13	5.84	-2.06	489.31	778.07	465.10	0.	594.63

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.35	20.70	54.80	5.55	8.43	540.98	1028.29	504.31	190.55	885.80
2	59.36	20.49	54.42	4.92	3.71	547.14	1003.20	511.08	190.97	862.28
3	55.56	22.56	50.68	4.88	4.58	554.83	984.57	511.48	212.51	745.96
4	46.30	28.74	43.79	2.51	11.23	617.80	782.92	540.88	296.62	565.92
5	38.93	30.28	32.15	6.78	16.49	647.91	710.52	554.63	323.65	441.70
6	24.87	36.26	14.29	10.58	28.49	700.84	624.58	559.39	410.28	259.13
7	17.43	40.17	8.00	9.43	34.96	739.87	596.88	557.92	470.99	175.15

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1087.85	0.496	1.109	0.958	0.216	0.217
2	1063.88	0.498	1.095	0.965	0.218	0.237
3	960.13	0.506	1.016	0.978	0.247	0.300
4	855.28	0.501	0.931	0.994	0.315	0.376
5	748.71	0.487	0.841	1.039	0.319	0.377
6	630.40	0.451	0.731	1.180	0.339	0.341
7	594.63	0.447	0.703	1.200	0.361	0.314

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1076.35	0.479	0.903	1.3348	0.148	0.027	0.8172	0.8247	0.9445	0.158
2	1051.29	0.485	0.889	1.3698	0.096	0.018	0.7673	0.7732	0.9477	0.177
3	958.47	0.491	0.801	1.5080	0.062	0.012	0.8676	0.8714	0.9207	0.250
4	862.93	0.545	0.692	1.6648	0.113	0.023	0.8142	0.8200	0.9457	0.304
5	765.55	0.572	0.631	1.9048	0.060	0.012	0.9119	0.9149	0.9556	0.368
6	669.61	0.623	0.556	2.2170	0.089	0.018	0.9065	0.9100	0.9629	0.389
7	646.13	0.659	0.592	2.3390	0.106	0.022	0.9013	0.9051	0.9996	0.394

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.177	1.078	1.149	1.066
2	10.0000	1.189	1.068	1.197	1.069
3	30.0000	1.220	1.071	1.227	1.070
4	50.0000	1.267	1.087	1.252	1.082
5	70.0000	1.292	1.083	1.271	1.078
6	90.0000	1.319	1.092	1.306	1.088
7	95.0000	1.347	1.098	1.322	1.092

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.2131	1.2442	1.2525
Adiabatic Efficiency =	0.7417	0.8420	0.8320
Polytropic Efficiency =	0.7487	0.8469	0.8373

Percent Design Speed =	80.1	Discharge Valve Setting=	30.0
Cor. Nozzle Weight Flow=	188.52	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9989	TE Check Flow/Noz.Flow =	0.9765
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

030320

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 12 READING NUMBER 48 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG RN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		20,59	39,47	=18,88		543,89		509.16	191,24	
2		20,10	39,11	=19,01		557,65		523,65	191,66	
3		21,72	39,01	=17,29		587,88		546,87	212,31	
4		26,62	39,80	=13,18		657,10		586,01	293,67	
5		27,86	40,86	=13,00		682,91		599,83	317,01	
6		33,67	42,22	=8,55		721,62		593,81	395,58	
7		37,53	42,76	=5,24		731,07		588,67	432,19	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		=0,70	=11,18	10,48	21,29	520,74		520,70	=6,40	
2		=0,18	=10,10	9,92	20,29	594,78		594,74	=1,89	
3		=3,23	=8,87	5,64	24,45	611,32		610,10	=34,44	
4		0,28	=8,75	9,03	26,34	664,34		663,59	3,20	
5		=2,50	=9,10	6,60	38,36	677,27		675,18	=29,48	
6		=1,02	=10,58	9,56	34,69	757,85		755,40	=13,46	
7		=0,25	=12,36	12,11	32,78	793,11		790,55	=3,42	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,482		1,023	0,162	=0,218
2		0,495		1,136	0,046	=0,205
3		0,521		1,116	0,087	=0,215
4		0,583		1,132	0,115	=0,127
5		0,609		1,176	0,142	=0,166
6		0,643		1,272	0,086	=0,256
7		0,670		1,343	0,086	=0,287

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,441		1,5230	0,161	0,053		=2,7502		=0,203
2		0,529		1,5440	0,121	0,039		1,5078		=0,191
3		0,545		1,6510	0,141	0,050		2,5089		=0,198
4		0,592		1,7428	0,059	0,017		4,6801		=0,116
5		0,605		1,9800	0,134	0,036		=14,5778		=0,149
6		0,680		2,0510	0,138	0,034		2,4049		=0,225
7		0,713		2,0980	0,127	0,030		2,3967		=0,249

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	,0000	0,953	0,996	0,976	1,000
2	10,0000	0,998	1,001	0,982	1,000
3	30,0000	0,976	0,999	0,969	1,000
4	50,0000	0,976	0,995	0,968	1,000
5	70,0000	0,955	0,995	0,970	1,000
6	90,0000	0,957	0,996	0,966	1,000
7	95,0000	0,948	0,995	0,966	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.2131	0.9750	0.9681
Polytropic Efficiency =	0.7487	0.8840	------

Percent Design Speed = 80.1 Discharge Valve Setting= 30.0
Cor. Nozzle Weight Flow= 188.52 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9816 TE Check Flow/Noz.Flow = 0.9897
Assumed LE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 13 READING NUMBER 49 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.66	0.	60.60	4.06	1.36	518.84	1204.61	514.86	0.	1087.15
2	63.50	0.	59.61	3.89	0.86	581.98	1188.85	530.11	0.	1063.19
3	60.78	0.	56.81	4.77	0.31	536.62	1099.38	536.61	0.	959.51
4	58.36	0.	52.56	5.80	-0.04	528.10	1004.72	526.58	0.	854.73
5	55.89	0.	49.71	6.18	-0.61	513.92	907.72	506.80	0.	748.23
6	54.10	0.	47.11	6.99	-0.67	475.20	789.11	456.10	0.	629.99
7	52.96	0.	46.13	6.83	-1.07	471.87	758.81	448.52	0.	594.25

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.73	28.80	54.80	3.93	5.93	560.53	944.49	489.76	269.22	806.44
2	58.28	27.45	54.42	3.86	5.22	556.44	937.50	492.53	255.86	796.71
3	54.27	29.01	50.68	3.59	6.52	563.41	943.57	492.59	273.17	684.68
4	48.30	31.34	43.79	4.51	10.86	583.82	748.45	497.84	303.22	558.76
5	39.09	35.14	32.15	6.94	16.80	618.46	651.46	504.59	355.14	409.92
6	25.76	40.39	14.29	11.47	28.34	665.00	564.44	501.93	424.97	242.21
7	17.51	43.97	8.08	9.51	35.45	709.81	541.20	505.67	486.18	159.53

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1087.15	0.475	1.102	0.991	0.299	0.312
2	1063.19	0.497	1.099	0.999	0.290	0.333
3	959.51	0.492	1.008	0.978	0.315	0.392
4	854.73	0.494	0.920	0.945	0.345	0.433
5	748.23	0.470	0.838	0.996	0.386	0.464
6	629.99	0.433	0.720	1.100	0.410	0.435
7	594.25	0.430	0.692	1.127	0.430	0.415

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	NOMEN MEAS	RISE/ T RISE	STAT PRESS RISE	PRESS COEFF
1	1075.66	0.490	0.625	1.3340	0.132	0.096	0.7554	0.7636		0.9203		0.240
2	1052.57	0.488	0.822	1.3690	0.093	0.018	0.8612	0.8373		0.9450		0.261
3	957.86	0.495	0.740	1.5090	0.149	0.010	0.9158	0.9189		0.9210		0.335
4	861.98	0.513	0.658	1.6848	0.096	0.011	0.9172	0.9204		0.9196		0.398
5	765.06	0.545	0.576	1.9040	0.054	0.011	0.9299	0.9325		0.9402		0.454
6	669.16	0.588	0.499	2.2170	0.076	0.015	0.9259	0.9289		0.9445		0.486
7	645.72	0.629	0.479	2.3690	0.103	0.021	0.9096	0.9133		0.9881		0.497

RADIAL POSITION	PERCENT DIVERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.286	1.101	1.249	1.094
2	10.0000	1.290	1.092	1.296	1.093
3	30.0000	1.308	1.091	1.309	1.088
4	50.0000	1.315	1.091	1.313	1.088
5	70.0000	1.326	1.098	1.318	1.086
6	90.0000	1.333	1.097	1.330	1.092
7	95.0000	1.365	1.102	1.339	1.095

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2927	1.3087	1.3136
Adiabatic Efficiency	=	0.8507	0.8930	0.8660
Polytropic Efficiency	=	0.8560	0.8970	0.8711

Percent Design Speed	= 80.1	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	185.71	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9913	TE Check Flow/Noz.Flow =	0.9683
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

030320

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 13 READING NUMBER 49 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID A G SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		28,46	39,47	=10,81		563,37		494,35	270,19	
2		26,96	39,11	=12,18		566,91		504,39	256,78	
3		27,43	39,01	=11,58		592,75		525,80	272,91	
4		29,20	39,80	=10,60		616,73		537,07	300,90	
5		32,64	40,86	=8,22		648,45		542,83	347,63	
6		37,81	42,22	=4,41		678,43		530,57	411,67	
7		41,27	42,76	=1,49		715,18		531,89	466,78	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		=0,10	=11,13	11,03	28,76	486,49		486,49	=0,82	
2		=0,73	=10,10	9,37	27,71	542,36		542,28	=6,90	
3		=2,20	=8,87	6,67	29,63	594,42		553,78	=21,28	
4		=1,31	=8,75	7,44	30,52	565,85		565,08	=12,93	
5		=2,76	=9,10	6,34	35,39	576,75		574,85	=27,69	
6		=1,02	=10,58	9,56	38,82	630,88		628,84	=11,16	
7		=0,01	=18,39	12,39	41,28	647,76		645,67	=0,15	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,492		0,994	0,294	0,040
2		0,497		1,075	0,192	0,048
3		0,522		1,053	0,216	0,059
4		0,544		1,052	0,227	0,103
5		0,573		1,059	0,263	0,113
6		0,601		1,185	0,219	0,066
7		0,634		1,214	0,247	0,041

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,424		1,5238	0,139	0,046		0,1635		0,038
2		0,475		1,5440	0,072	0,023		0,5767		0,045
3		0,497		1,6310	0,079	0,024		0,4810		0,055
4		0,498		1,7420	0,048	0,014		0,6672		0,097
5		0,508		1,8000	0,042	0,011		0,5579		0,106
6		0,557		2,0510	0,065	0,016		0,5023		0,060
7		0,572		2,0980	0,074	0,018		0,2381		0,038

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	9,0000	0,965	0,993	0,978	1,000
2	10,0000	0,994	1,001	0,989	1,000
3	30,0000	0,986	0,997	0,987	1,000
4	50,0000	0,989	0,997	0,991	1,000
5	70,0000	0,980	0,994	0,992	1,000
6	90,0000	0,984	0,995	0,988	1,000
7	95,0000	0,963	0,994	0,982	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2927	0.9878	0.9839
Polytropic Efficiency	=	0.8560	0.9543	------

Percent Design Speed	= 80.1	Discharge Valve Setting	= 15.0
Cor. Nozzle Weight Flow	= 185.71	Vane Schedule	= 0.0

LE Check Flow/Noz.Flow	= 0.9733	TE Check Flow/Noz.Flow	= 0.9663
Assumed LE Flow Coeff.	= 0.955	Assumed TE Flow Coeff.	= 0.935

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 14 READING NUMBER 50 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.09	0.	60.60	5.49	-.79	485.52	1190.23	481.80	0.	1086.69
2	65.15	0.	59.61	5.54	2.51	494.01	1171.96	492.28	0.	1062.75
3	62.40	0.	56.01	6.39	1.93	501.37	1089.25	501.36	0.	959.11
4	60.19	0.	52.58	7.68	1.79	490.93	985.38	489.52	0.	854.37
5	58.09	0.	49.71	8.38	1.89	472.20	884.50	465.65	0.	747.92
6	56.28	0.	47.11	9.17	1.51	437.87	767.00	420.27	0.	629.73
7	55.15	0.	46.13	9.02	1.12	435.21	736.37	413.67	0.	594.00

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.58	36.69	54.80	2.78	8.51	579.57	865.59	463.57	345.39	729.82
2	57.63	34.52	54.42	3.21	7.52	564.96	868.32	464.48	319.44	732.69
3	54.04	35.35	50.68	3.36	8.36	562.39	781.02	458.57	325.34	632.12
4	48.77	37.82	43.79	4.98	11.42	568.95	681.87	449.34	348.84	512.78
5	40.21	41.15	33.15	6.96	17.86	591.86	583.62	444.80	388.70	376.04
6	26.38	45.39	14.29	12.09	29.90	635.83	500.83	443.07	449.15	219.75
7	16.79	48.96	8.00	8.79	38.36	684.43	474.52	445.01	511.18	134.27

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1086.69	0.443	1.086	0.962	0.381	0.378
2	1062.75	0.451	1.078	0.944	0.358	0.395
3	959.11	0.458	0.989	0.919	0.378	0.457
4	854.37	0.448	0.908	0.918	0.413	0.502
5	747.92	0.430	0.806	0.955	0.456	0.536
6	629.73	0.398	0.697	1.054	0.482	0.531
7	994.00	0.396	0.669	1.076	0.511	0.522

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1075.21	0.501	0.748	1.3340	0.142	0.028	0.7894	0.7985	0.9428	0.301
2	1052.13	0.491	0.754	1.3690	0.109	0.021	0.8378	0.8449	0.9412	0.320
3	957.46	0.490	0.680	1.5080	0.083	0.010	0.9233	0.9267	0.9293	0.399
4	861.62	0.496	0.595	1.6640	0.094	0.011	0.9306	0.9331	0.9166	0.468
5	764.74	0.519	0.511	1.9040	0.064	0.013	0.9271	0.9302	0.9494	0.531
6	668.90	0.559	0.440	2.2170	0.071	0.014	0.9383	0.9409	0.9351	0.590
7	645.45	0.603	0.418	2.3390	0.102	0.021	0.9199	0.9234	0.9828	0.615

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.381	1.127	1.362	1.117
2	10.0000	1.372	1.115	1.374	1.114
3	30.0000	1.375	1.108	1.374	1.103
4	50.0000	1.365	1.106	1.364	1.100
5	70.0000	1.358	1.101	1.347	1.096
6	90.0000	1.360	1.108	1.356	1.098
7	95.0000	1.395	1.108	1.368	1.102

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.3534	1.3642	1.3695
Adiabatic Efficiency =	0.8755	0.8996	0.8680
Polytropic Efficiency =	0.8808	0.9039	0.8738

Percent Design Speed =	80.0	Discharge Valve Setting=	09.0
Cor. Nozzle Weight Flow=	174.54	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9942	TE Check Flow/Noz.Flow =	0.9726
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW @ NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 14 READING NUMBER 50 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID MG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		36.53	39.47	-2.94		582.31		467.89	346.64	
2		34.00	39.11	-5.11		573.39		475.36	320.60	
3		33.65	39.01	-5.36		586.89		488.31	325.03	
4		35.58	39.80	-4.22		594.85		482.82	344.37	
5		38.42	40.86	-2.24		612.72		476.27	380.48	
6		42.85	42.22	0.63		642.41		466.85	433.05	
7		46.43	42.76	3.67		683.39		466.83	490.78	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.06	-11.13	11.07	36.59	456.78		456.77	-0.48	
2		-1.04	-10.18	9.06	35.04	508.97		508.86	-9.23	
3		-2.35	-8.97	6.52	36.00	507.58		506.94	-20.78	
4		-1.77	-8.75	6.98	37.35	498.69		497.90	-15.37	
5		-2.90	-9.10	6.20	41.52	489.06		487.39	-24.66	
6		-0.34	-10.58	10.24	43.19	528.57		524.94	-3.13	
7		-1.05	-12.36	11.31	47.49	537.69		535.82	-9.85	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.504		0.976	0.411	0.162
2		0.498		1.070	0.298	0.181
3		0.512		1.038	0.315	0.209
4		0.520		1.031	0.335	0.265
5		0.538		1.028	0.376	0.301
6		0.565		1.124	0.343	0.278
7		0.602		1.148	0.385	0.233

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.393		1.5238	0.191	0.050		0.4287		0.153
2		0.440		1.5440	0.041	0.013		0.8584		0.172
3		0.441		1.6310	0.040	0.012		0.8415		0.198
4		0.434		1.7420	0.028	0.008		0.9050		0.253
5		0.426		1.8800	0.022	0.006		0.8382		0.286
6		0.459		2.0510	0.047	0.011		0.8581		0.263
7		0.469		2.0980	0.071	0.017		0.6196		0.217

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.963	0.992	0.976	1.000
2	10.0000	0.995	0.999	0.994	1.000
3	30.0000	0.993	0.996	0.994	1.000
4	50.0000	0.995	0.995	0.995	1.000
5	70.0000	0.988	0.996	0.996	1.000
6	90.0000	0.990	0.995	0.991	1.000
7	95.0000	0.965	0.995	0.984	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3534	0.9921	0.9883
Polytropic Efficiency	=	0.8808	0.9744	------

Percent Design Speed =	80.0	Discharge Valve Setting=	09.0
Cor. Nozzle Weight Flow=	174.54	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9777	TE Check Flow/Noz.Flow =	0.9708
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

033370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 15 READING NUMBER 91 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR L LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67,75	0,	60,60	7,15	4,15	448,32	1176,06	444,88	0,	1087,26
2	66,71	0,	59,61	7,10	4,07	450,35	1158,28	457,74	0,	1063,30
3	64,15	0,	56,01	8,14	3,68	464,98	1066,33	464,96	0,	959,61
4	62,20	0,	52,56	9,64	3,80	452,03	966,98	450,73	0,	854,82
5	60,15	0,	49,71	10,44	3,65	435,41	865,76	429,37	0,	748,30
6	58,31	0,	47,11	11,20	3,94	405,29	749,15	389,00	0,	630,06
7	57,21	0,	46,13	11,08	3,18	402,74	717,91	382,81	0,	594,31

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	56,97	42,73	54,80	2,17	16,78	596,90	808,69	437,03	403,66	672,11
2	57,23	38,81	54,42	2,81	9,48	574,13	825,66	446,52	359,11	693,57
3	54,12	39,58	50,68	3,44	16,03	562,69	739,99	433,62	358,42	599,53
4	50,15	43,17	43,79	6,36	12,05	553,39	629,87	405,56	378,54	483,53
5	40,05	45,92	32,15	7,90	26,11	588,15	534,70	408,49	421,79	343,35
6	27,47	48,49	14,29	13,18	30,53	616,29	468,85	405,62	458,33	210,92
7	17,14	51,57	8,08	9,14	40,00	668,19	439,76	411,69	518,85	126,94

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1087,26	0,408	1,070	0,982	0,445	0,403
2	1063,30	0,418	1,056	0,979	0,400	0,421
3	959,61	0,424	0,972	0,933	0,417	0,484
4	854,82	0,411	0,860	0,895	0,465	0,528
5	748,30	0,396	0,787	0,951	0,511	0,571
6	630,06	0,368	0,660	1,048	0,524	0,599
7	594,31	0,365	0,651	1,075	0,549	0,604

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE	STAT PRESS COEFF
1	1075,77	0,511	0,698	1,3340	0,181	0,037	0,7642	0,7753	0,9445		0,325
2	1052,62	0,494	0,711	1,3698	0,190	0,030	0,8040	0,8134	0,9005		0,345
3	957,95	0,488	0,641	1,5088	0,076	0,015	0,9028	0,9074	0,9368		0,428
4	862,07	0,470	0,547	1,6840	0,109	0,021	0,8729	0,8785	0,9290		0,497
5	765,13	0,213	0,456	1,9060	0,093	0,019	0,9063	0,9105	0,9346		0,570
6	669,25	0,539	0,405	2,2178	0,083	0,017	0,9332	0,9362	0,9066		0,666
7	645,78	0,586	0,380	2,3390	0,112	0,023	0,9193	0,9229	0,9477		0,708

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	1,433	1,148	1,407	1,134
2	10,0000	1,416	1,135	1,415	1,130
3	30,0000	1,410	1,118	1,409	1,114
4	50,0000	1,382	1,113	1,374	1,109
5	70,0000	1,383	1,111	1,378	1,105
6	90,0000	1,378	1,109	1,377	1,103
7	95,0000	1,420	1,114	1,384	1,106

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.3814	1.3927	1.4006
Adiabatic Efficiency =	0.8468	0.8691	0.8427
Polytropic Efficiency =	0.8537	0.8751	0.8500

Percent Design Speed = 80.1 Discharge Valve Setting= 06.0
Cor. Nozzle Weight Flow= 162.43 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0019 TE Check Flow/Noz.Flow = 0.9860
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 15 READING NUMBER 51 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		42.57	39.47	3.10		598.86		441.03	405.11	
2		38.27	39.11	-0.84		581.88		456.81	360.41	
3		37.83	39.01	-1.18		584.06		461.09	358.08	
4		40.92	39.80	1.12		573.22		432.39	374.77	
5		43.41	40.86	2.55		603.44		436.42	412.87	
6		46.00	42.22	3.78		619.15		426.68	441.90	
7		49.11	42.76	6.35		664.25		431.34	498.14	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.70	-11.13	11.83	41.86	439.51		439.47	5.40	
2		-0.61	-10.10	9.49	38.88	487.35		487.30	-5.17	
3		-1.29	-8.87	7.58	39.12	479.09		478.77	-10.77	
4		-1.28	-8.75	7.47	42.19	432.37		431.79	-9.61	
5		-1.25	-9.10	7.85	44.66	436.38		437.34	-9.53	
6		1.48	-10.58	12.06	44.53	461.98		460.40	-11.86	
7		-1.43	-12.36	10.78	50.75	464.19		462.51	-13.20	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.514		0.996	0.485	0.227
2		0.501		1.067	0.366	0.258
3		0.507		1.038	0.373	0.290
4		0.496		0.999	0.437	0.368
5		0.527		1.002	0.458	0.398
6		0.542		1.079	0.420	0.385
7		0.582		1.072	0.481	0.321

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOWEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.375		1.5230	0.137	0.045		0.5036		0.216
2		0.418		1.5440	0.037	0.012		0.8745		0.246
3		0.413		1.6310	0.034	0.010		0.8950		0.278
4		0.373		1.7420	0.029	0.008		0.8595		0.354
5		0.379		1.8800	0.035	0.009		0.8496		0.381
6		0.400		2.0510	0.093	0.013		0.8774		0.368
7		0.402		2.0980	0.084	0.020		0.6361		0.303

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.960	0.988	0.977	1.000
2	10.0000	0.994	0.996	0.994	1.000
3	30.0000	0.994	0.997	0.995	1.000
4	50.0000	0.990	0.997	0.995	1.000
5	70.0000	0.986	0.996	0.994	1.000
6	90.0000	0.989	0.994	0.990	1.000
7	95.0000	0.958	0.993	0.982	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3814	0.9919	0.9863
Polytropic Efficiency	=	0.8537	0.9755	------

Percent Design Speed	= 80.1	Discharge Valve Setting	= 06.0
Cor. Nozzle Weight Flow	= 162.43	Vane Schedule	= 0.0

LE Check Flow/Noz.Flow	= 0.9777	TE Check Flow/Noz.Flow	= 0.9912
Assumed LE Flow Coeff.	= 0.9550	Assumed TE Flow Coeff.	= 0.9350

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 10 READING NUMBER 52 DATE 3/ 1/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	69.72	0.	60.60	9.12	6.42	404.92	1160.13	401.82	0.	1087.17
2	68.64	0.	59.61	9.03	6.00	417.34	1142.19	415.88	0.	1063.21
3	66.40	0.	56.01	10.39	5.93	419.12	1047.08	419.11	0.	959.53
4	64.70	0.	52.54	12.14	6.30	405.25	949.95	404.08	0.	854.75
5	62.38	0.	49.71	12.67	5.83	396.98	847.03	391.48	0.	748.24
6	60.23	0.	47.11	13.12	5.46	375.41	733.38	360.32	0.	630.00
7	59.21	0.	46.13	13.08	5.18	372.61	705.41	354.17	0.	594.26

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.38	46.22	54.05	3.58	11.34	583.90	769.91	403.21	420.79	654.89
2	56.86	43.22	54.42	2.44	11.77	585.41	779.82	425.86	400.21	659.37
3	55.28	44.14	50.63	4.40	12.13	553.19	696.83	396.89	385.21	572.67
4	50.17	50.29	43.79	6.38	14.53	561.49	560.10	358.70	431.90	430.10
5	40.81	48.38	32.15	8.66	21.97	580.61	509.23	384.67	432.91	332.16
6	28.14	49.94	14.29	13.85	32.09	607.04	445.61	388.17	461.56	207.63
7	17.25	52.84	8.00	9.25	41.95	661.32	423.40	396.18	522.70	123.03

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	1087.17	0.367	1.052	1.008	0.471	0.402
2	1063.21	0.379	1.037	1.026	0.445	0.420
3	959.53	0.381	0.951	0.947	0.456	0.480
4	854.75	0.368	0.858	0.888	0.544	0.516
5	748.24	0.340	0.768	0.883	0.534	0.579
6	630.00	0.310	0.664	1.072	0.538	0.619
7	594.26	0.337	0.635	1.118	0.563	0.636

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1075.68	0.498	0.657	1.3340	0.231	0.049	0.7271	0.7406	0.9329	0.326
2	1052.59	0.502	0.667	1.3690	0.193	0.040	0.7645	0.7763	0.9271	0.345
3	957.88	0.477	0.601	1.4080	0.137	0.026	0.8375	0.8452	0.9284	0.426
4	862.00	0.494	0.483	1.4840	0.178	0.034	0.8138	0.8216	0.9307	0.487
5	765.07	0.504	0.443	1.9040	0.136	0.027	0.8746	0.8797	0.9258	0.541
6	669.19	0.530	0.389	2.2170	0.096	0.019	0.9277	0.9309	0.9051	0.692
7	645.73	0.579	0.371	2.3390	0.112	0.023	0.9239	0.9275	0.9389	0.748

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.436	1.156	1.429	1.148
2	10.0000	1.439	1.160	1.436	1.146
3	30.0000	1.413	1.128	1.407	1.123
4	50.0000	1.392	1.127	1.381	1.119
5	70.0000	1.390	1.115	1.383	1.121
6	90.0000	1.385	1.110	1.384	1.105
7	95.0000	1.431	1.116	1.395	1.108

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3864	1.4026	1.4095
Adiabatic Efficiency	=	0.7942	0.8237	0.8018
Polytropic Efficiency	=	0.8035	0.8320	0.8112

Percent Design Speed	= 80.1	Discharge Valve Setting=	03.5
Cor. Nozzle Weight Flow=	150.16	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9977	TE Check Flow/Noz.Flow =	0.9907
Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 16 READING NUMBER 52 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		46,07	39,47	6,60		586,41		406,85	422,31	
2		42,68	39,11	3,57		592,47		435,51	401,67	
3		42,41	39,01	3,40		570,79		421,23	384,84	
4		48,12	39,80	8,32		575,15		383,46	427,60	
5		49,92	40,86	9,06		592,34		410,42	423,76	
6		47,48	42,22	5,26		608,30		406,03	445,02	
7		50,42	42,76	7,66		636,87		414,82	501,84	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1,70	-11,13	12,83	44,36	437,82		436,82	13,00	
2		1,72	-10,10	11,82	46,97	478,99		478,75	14,34	
3		-0,79	-8,87	8,08	43,21	430,67		430,45	-5,97	
4		-0,79	-8,75	7,96	48,91	387,66		387,19	-5,37	
5		-0,77	-9,10	8,33	48,68	407,01		406,10	-5,45	
6		3,23	-10,58	13,81	44,26	426,64		424,66	23,94	
7		-1,56	-12,36	10,80	52,98	433,17		431,61	-11,76	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,500		1,074	0,484	0,280
2		0,508		1,099	0,403	0,287
3		0,493		1,072	0,455	0,344
4		0,497		1,018	0,541	0,432
5		0,515		0,989	0,504	0,449
6		0,531		1,041	0,464	0,438
7		0,574		1,048	0,523	0,360

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0,370		1,5278	0,142	0,046		0,6391		0,248
2		0,408		1,5440	0,050	0,016		0,8355		0,274
3		0,369		1,6310	0,062	0,019		0,8056		0,330
4		0,332		1,7420	0,071	0,020		0,8000		0,417
5		0,350		1,8600	0,056	0,015		0,8550		0,433
6		0,368		2,0510	0,070	0,017		0,8684		0,421
7		0,374		2,0986	0,093	0,022		0,6454		0,341

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,973	0,993	0,978	1,000
2	10,0000	0,990	0,997	0,992	1,000
3	30,0000	0,986	0,995	0,991	1,000
4	50,0000	0,982	0,992	0,989	1,000
5	70,0000	0,986	0,997	0,991	1,000
6	90,0000	0,987	0,996	0,988	1,000
7	95,0000	0,956	0,993	0,981	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3864	0.9885	0.9832
Polytropic Efficiency	=	0.8035	0.9763	------

Percent Design Speed =	80.1	Discharge Valve Setting=	03.5
Cor. Nozzle Weight Flow=	150.16	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9960	TE Check Flow/Noz.Flow =	0.9907
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

822870

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 10 READING NUMBER 35 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	63.96	0.	60.60	3.36	0.66	602.05	1362.89	597.44	0.	1222.78
2	62.94	0.	59.61	3.33	0.30	613.12	1343.79	610.97	0.	1195.76
3	60.13	0.	56.01	4.12	-0.34	619.90	1244.53	619.89	0.	1079.16
4	57.54	0.	52.56	4.98	-0.86	613.17	1140.22	611.41	0.	961.31
5	54.97	0.	49.71	5.26	-1.53	598.26	1032.51	589.97	0.	841.52
6	53.18	0.	47.11	6.07	-1.99	552.71	898.63	530.50	0.	708.55
7	52.11	0.	46.13	5.98	-1.92	547.13	863.73	520.66	0.	668.34

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.90	22.44	54.80	5.10	4.06	614.27	1129.41	565.84	233.65	976.13
2	59.38	22.23	54.42	4.96	3.56	611.16	1108.59	564.17	230.59	953.22
3	55.91	26.45	50.68	5.23	4.21	609.33	973.27	545.40	271.33	805.97
4	46.30	32.46	43.79	2.51	11.24	682.94	834.05	576.12	366.50	609.96
5	38.78	33.08	32.15	6.63	16.19	707.96	760.26	591.43	385.27	479.18
6	25.26	38.76	14.29	10.97	27.92	764.47	661.27	590.44	474.06	278.56
7	16.52	43.38	8.00	8.52	35.59	814.48	622.85	584.91	552.75	173.48

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	1222.78	0.555	1.257	0.947	0.235	0.229
2	1195.76	0.566	1.241	0.923	0.237	0.249
3	1079.16	0.573	1.150	0.880	0.290	0.311
4	961.31	0.566	1.053	0.942	0.364	0.354
5	841.52	0.552	0.952	1.002	0.362	0.406
6	708.55	0.507	0.825	1.113	0.386	0.377
7	668.34	0.502	0.793	1.125	0.422	0.353

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOWRN RISE MEAS T RISE	STAT PRESS RISE COEFF
1	1209.79	0.542	0.996	1.3340	0.164	0.031	0.6285	0.6384	0.9891	0.157
2	1183.81	0.540	0.979	1.3690	0.099	0.018	0.7806	0.7878	0.9964	0.176
3	1077.29	0.536	0.856	1.5080	0.102	0.019	0.8074	0.8144	0.9784	0.248
4	969.46	0.599	0.732	1.6840	0.141	0.029	0.7934	0.8019	0.9904	0.309
5	860.45	0.626	0.673	1.9060	0.075	0.015	0.8973	0.9016	1.0235	0.386
6	752.62	0.677	0.586	2.2170	0.132	0.027	0.8680	0.8740	0.9938	0.418
7	726.23	0.722	0.552	2.3390	0.155	0.032	0.8601	0.8666	1.0141	0.425

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.242	1.092	1.211	1.090
2	10.0000	1.251	1.088	1.265	1.089
3	30.0000	1.281	1.096	1.296	1.095
4	50.0000	1.348	1.115	1.345	1.112
5	70.0000	1.383	1.104	1.354	1.101
6	90.0000	1.409	1.116	1.386	1.113
7	95.0000	1.451	1.127	1.401	1.118

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.2726	1.3206	1.3285
Adiabatic Efficiency =	0.7030	0.8153	0.8151
Polytropic Efficiency =	0.7129	0.8225	0.8224

Percent Design Speed = 90.1 Discharge Valve Setting= 30.0
Cor. Nozzle Weight Flow= 205.36 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9993 TE Check Flow/Noz.Flow = 0.9711
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 2 NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 35 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHRD LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		22.31	39.47	-17.16		617.74		571.60	234.50	
2		21.79	39.11	-17.32		623.36		578.78	231.43	
3		24.88	39.01	-14.13		644.74		584.57	271.06	
4		30.08	39.80	-9.72		725.64		626.46	362.85	
5		30.41	40.86	-10.45		749.64		642.48	377.13	
6		36.03	42.22	-6.19		785.49		628.52	457.07	
7		40.63	42.76	-9.13		823.77		618.47	530.69	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.29	-11.13	11.42	22.02	604.92		604.90	3.06	
2		0.32	-10.10	10.42	21.48	685.70		685.46	3.77	
3		-2.66	-8.87	6.21	27.53	707.94		706.49	-32.78	
4		0.55	-8.75	9.30	29.53	771.23		770.34	7.41	
5		-3.28	-9.10	5.82	33.70	779.97		777.03	-44.59	
6		-1.31	-10.58	9.27	37.34	840.88		837.27	-19.14	
7		-0.29	-12.36	12.14	40.85	846.62		843.89	-3.26	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.545		1.058	0.144	-0.280
2		0.551		1.185	0.018	-0.282
3		0.569		1.209	0.047	-0.302
4		0.640		1.230	0.077	-0.209
5		0.667		1.209	0.108	-0.268
6		0.698		1.332	0.076	-0.384
7		0.731		1.364	0.124	-0.378

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.533		1.5230	0.217	0.071		-7.2194		-0.255
2		0.610		1.5440	0.145	0.047		1.3553		-0.256
3		0.629		1.6310	0.170	0.052		1.4798		-0.272
4		0.685		1.7420	0.082	0.023		1.5710		-0.185
5		0.697		1.8800	0.136	0.036		3.1546		-0.233
6		0.752		2.0510	0.229	0.056		2.6570		-0.325
7		0.797		2.0980	0.262	0.062		5.8890		-0.315

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.935	0.998	0.959	1.000
2	10.0000	0.984	1.001	0.973	1.000
3	30.0000	0.978	0.999	0.967	1.000
4	50.0000	0.978	0.997	0.986	1.000
5	70.0000	0.944	0.997	0.964	1.000
6	90.0000	0.920	0.998	0.935	1.000
7	95.0000	0.887	0.992	0.919	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.2726	0.9637	0.9579
Polytropic Efficiency	=	0.7129	0.8667	------

Percent Design Speed =	90.1	Discharge Valve Setting=	30.0
Cor. Nozzle Weight Flow=	205.36	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9762	TE Check Flow/Noz.Flow =	1.0183
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

822870

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 6 READING NUMBER 31 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHRD LN LE ANGLE	INCID ANG MN CHRD LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.38	0.	60.60	3.78	1.08	591.96	1360.30	587.42	0.	1224.75
2	63.17	0.	59.61	3.56	0.53	607.86	1343.18	605.73	0.	1197.76
3	60.49	0.	56.01	4.48	0.02	611.76	1242.07	611.75	0.	1080.96
4	58.01	0.	52.56	5.45	-0.39	603.15	1134.22	601.41	0.	962.91
5	55.13	0.	49.71	5.42	-1.37	595.69	1032.17	587.43	0.	842.93
6	53.87	0.	47.11	6.76	-0.90	539.78	891.67	518.68	0.	709.73
7	52.75	0.	46.13	6.62	-1.28	539.61	857.36	509.11	0.	669.46

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHRD LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.66	29.76	54.80	4.86	4.71	613.90	1053.13	531.36	303.79	908.62
2	58.91	29.74	54.42	4.49	4.26	613.93	1030.80	531.78	303.79	882.00
3	54.80	32.14	50.68	4.12	5.69	623.02	915.17	527.43	331.32	747.77
4	46.39	35.39	43.79	2.60	11.62	676.84	799.93	551.66	391.94	579.14
5	39.22	36.53	32.15	7.07	15.91	690.90	716.10	553.65	410.05	451.84
6	25.90	41.66	14.29	11.61	27.97	740.23	617.20	548.72	487.71	286.17
7	16.87	46.00	8.00	8.87	39.88	790.81	579.62	543.35	562.66	164.78

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1224.75	0.546	1.254	0.905	0.309	0.312
2	1197.76	0.561	1.240	0.878	0.315	0.333
3	1080.96	0.565	1.147	0.862	0.352	0.393
4	962.91	0.556	1.048	0.917	0.399	0.435
5	842.93	0.549	0.952	0.942	0.411	0.477
6	709.73	0.495	0.818	1.058	0.434	0.448
7	669.46	0.491	0.786	1.067	0.470	0.432

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1211.81	0.533	0.915	1.3340	0.147	0.028	0.7381	0.7485	0.9640	0.227
2	1185.79	0.535	0.898	1.3690	0.109	0.021	0.8084	0.8167	0.9867	0.247
3	1079.09	0.542	0.797	1.5080	0.097	0.018	0.8485	0.8554	0.9583	0.322
4	971.08	0.591	0.698	1.4840	0.125	0.026	0.8330	0.8409	0.9734	0.387
5	861.89	0.606	0.628	1.9060	0.048	0.010	0.9400	0.9429	0.9671	0.456
6	753.88	0.652	0.543	2.2170	0.087	0.018	0.9164	0.9205	0.9620	0.490
7	727.44	0.697	0.511	2.3390	0.124	0.025	0.8984	0.9896	0.9896	0.506

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.353	1.123	1.332	1.116
2	10.0000	1.359	1.117	1.364	1.116
3	30.0000	1.385	1.120	1.389	1.116
4	50.0000	1.425	1.126	1.405	1.123
5	70.0000	1.421	1.118	1.412	1.11
6	90.0000	1.429	1.123	1.422	1.1.6
7	95.0000	1.472	1.133	1.431	1. 2:

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.3761	1.3946	1.4022
Adiabatic Efficiency =	0.8212	0.8574	0.8356
Polytropic Efficiency =	0.8292	0.8639	0.8433

Percent Design Speed = 90.2 Discharge Valve Setting= 15.0
Cor. Nozzle Weight Flow= 204.39 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9946 TE Check Flow/Noz.Flow = 0.9663
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 6 READING NUMBER 31 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		29.61	39.47	-9.86		617.09		536.51	304.88	
2		29.22	39.11	-9.89		624.50		544.99	304.89	
3		30.40	39.01	-8.61		654.91		564.23	331.01	
4		32.98	39.80	-6.82		714.42		598.00	388.04	
5		33.85	40.86	-7.01		724.74		598.42	401.38	
6		38.97	42.22	-3.25		755.19		581.40	470.23	
7		43.32	42.76	0.56		795.24		572.88	540.21	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.54	-11.13	10.59	30.15	511.22		511.19	-4.86	
2		-0.54	-10.10	9.56	29.76	576.79		576.73	-5.40	
3		-1.43	-8.87	7.44	31.83	608.56		607.92	-15.19	
4		-0.36	-8.75	8.11	32.62	634.14		633.42	-3.93	
5		-2.08	-9.10	7.02	35.93	646.23		644.43	-23.37	
6		-0.57	-10.58	10.01	39.54	687.56		685.41	-6.83	
7		0.41	-12.36	12.77	42.91	706.85		704.06	5.04	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.536		0.953	0.336	0.087
2		0.544		1.058	0.237	0.097
3		0.572		1.077	0.232	0.096
4		0.626		1.059	0.246	0.138
5		0.638		1.077	0.263	0.135
6		0.666		1.179	0.241	0.087
7		0.701		1.229	0.269	0.051

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOWEN RISE/ MEAN T RISE	STAT PRESS RISE COEFF
1		0.442		1.5230	0.157	0.051		0.2876		0.082
2		0.501		1.5440	0.076	0.025		0.6698		0.091
3		0.530		1.6310	0.056	0.017		0.7242		0.089
4		0.559		1.7420	0.024	0.007		0.6587		0.127
5		0.566		1.8800	0.050	0.013		0.6803		0.124
6		0.604		2.0510	0.072	0.018		0.5283		0.079
7		0.620		2.0980	0.080	0.019		0.2550		0.046

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.957	0.994	0.972	1.000
2	10.0000	0.990	0.998	0.986	1.000
3	30.0000	0.992	0.997	0.989	1.000
4	50.0000	0.981	0.997	0.994	1.000
5	70.0000	0.982	0.994	0.988	1.000
6	90.0000	0.976	0.994	0.981	1.000
7	95.0000	0.950	0.989	0.977	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3761	0.9867	0.9806
Polytropic Efficiency	=	0.8292	0.9598	------

Percent Design Speed =	90.2	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	204.39	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9714	TE Check Flow/Noz.Flow =	0.9776
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

b29870

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 32 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.22	0.	60.60	4.62	1.92	568.35	1347.61	564.00	0.	1221.89
2	64.17	0.	59.61	4.56	1.53	580.57	1328.54	578.53	0.	1194.97
3	61.53	0.	56.01	5.52	1.06	584.73	1226.76	584.72	0.	1078.44
4	59.37	0.	52.56	6.81	0.97	570.37	1117.23	568.73	0.	964.67
5	57.17	0.	49.71	7.46	0.67	550.25	1004.99	542.63	0.	840.96
6	55.31	0.	47.11	8.20	0.54	510.69	873.02	490.16	0.	708.08
7	54.25	0.	46.13	8.12	0.22	505.85	837.84	480.81	0.	667.90

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV AND TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.56	39.78	54.80	2.76	7.66	655.39	937.81	502.46	418.40	790.58
2	57.58	37.44	54.42	3.16	6.59	637.99	943.79	505.51	387.08	795.95
3	53.69	39.08	50.68	3.01	7.84	638.57	836.73	495.41	402.39	674.18
4	48.10	41.20	43.79	4.31	11.27	647.13	729.12	486.86	426.17	549.54
5	40.26	43.94	32.15	8.11	16.91	660.75	623.65	474.97	457.65	409.23
6	29.45	47.66	14.29	15.16	25.86	676.70	525.86	452.51	496.65	255.47
7	16.40	51.78	8.00	8.40	37.85	756.53	493.77	463.98	589.21	136.54

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1221.89	0.523	1.239	0.891	0.420	0.410
2	1194.97	0.534	1.223	0.874	0.396	0.429
3	1078.44	0.538	1.130	0.847	0.427	0.491
4	960.67	0.524	1.027	0.856	0.461	0.541
5	840.96	0.505	0.922	0.875	0.500	0.579
6	708.08	0.467	0.798	0.923	0.529	0.592
7	667.90	0.462	0.766	0.965	0.568	0.587

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1208.98	0.560	0.802	1.3340	0.190	0.030	0.7970	0.8085	0.9803	0.315
2	1183.03	0.548	0.811	1.3690	0.116	0.023	0.8430	0.8521	0.9749	0.336
3	1076.58	0.549	0.720	1.5080	0.067	0.013	0.9130	0.9181	0.9412	0.418
4	968.81	0.559	0.630	1.6840	0.066	0.013	0.9215	0.9259	0.9412	0.495
5	859.88	0.575	0.543	1.9060	0.059	0.012	0.9357	0.9391	0.9828	0.564
6	752.12	0.590	0.459	2.2170	0.099	0.019	0.9142	0.9187	0.9500	0.644
7	725.75	0.664	0.431	2.3390	0.107	0.022	0.9163	0.9209	0.9644	0.673

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.530	1.166	1.508	1.157
2	10.0000	1.519	1.151	1.522	1.152
3	30.0000	1.521	1.148	1.524	1.140
4	50.0000	1.510	1.141	1.502	1.134
5	70.0000	1.487	1.129	1.469	1.124
6	90.0000	1.457	1.127	1.459	1.125
7	95.0000	1.528	1.143	1.478	1.129

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.4863	1.5001	1.5073
Adiabatic Efficiency =	0.8739	0.8955	0.8709
Polytropic Efficiency =	0.8807	0.9013	0.8782

Percent Design Speed = 90.0 Discharge Valve Setting= 09.0
Cor. Nozzle Weight Flow= 196.56 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9943 TE Check Flow/Noz.Flow = 0.9605
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 7 READING NUMBER 32 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		39.69	39.47	-0.19		658.48		507.20	419.91	
2		36.89	39.11	+2.22		647.26		517.69	388.48	
3		37.25	39.01	+1.76		664.38		528.97	402.01	
4		38.82	39.80	+0.98		674.37		524.45	421.93	
5		41.32	40.86	0.46		681.74		509.61	447.98	
6		45.11	42.22	-2.89		681.44		477.02	478.85	
7		49.26	42.76	-6.50		752.97		487.22	565.69	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		+0.12	+11.13	11.01	39.74	500.60		500.60	+1.00	
2		+0.11	+10.10	9.99	36.99	558.67		558.44	+1.06	
3		+1.13	+8.87	7.74	38.39	558.52		557.98	+11.02	
4		+1.08	+8.75	7.67	39.90	543.57		542.87	+10.23	
5		+1.98	+9.10	7.12	43.30	516.87		515.45	+17.81	
6		-0.36	+10.58	10.94	44.75	529.75		528.11	-3.28	
7		+1.36	+12.36	11.00	50.62	535.07		533.20	+12.67	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.563		0.987	0.450	0.206
2		0.557		1.079	0.331	0.230
3		0.573		1.056	0.350	0.264
4		0.584		1.035	0.377	0.306
5		0.595		1.011	0.422	0.353
6		0.595		1.107	0.396	0.369
7		0.657		1.094	0.469	0.302

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAN V RISE	STAT PRESS RISE COEFF
1		0.424		1.5230	0.158	0.052		0.4985		0.194
2		0.477		1.5440	0.042	0.014		0.9013		0.217
3		0.479		1.6310	0.037	0.011		0.9138		0.248
4		0.467		1.7420	0.022	0.006		0.8850		0.288
5		0.445		1.8800	0.023	0.006		0.8378		0.334
6		0.456		2.0510	0.036	0.009		0.9373		0.350
7		0.460		2.0980	0.082	0.020		0.6243		0.281

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.955	0.992	0.969	1.000
2	10.0000	0.995	1.001	0.992	1.000
3	30.0000	0.994	0.993	0.993	1.000
4	50.0000	0.991	0.994	0.995	1.000
5	70.0000	0.983	0.996	0.995	1.000
6	90.0000	0.994	0.999	0.992	1.000
7	95.0000	0.947	0.988	0.979	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.4863	0.9908	0.9859
Polytropic Efficiency	=	0.8807	0.9771	------

Percent Design Speed	= 90.0	Discharge Valve Setting	= 09.0
Cor. Nozzle Weight Flow	= 196.56	Vane Schedule	= 0.0

LE Check Flow/Noz.Flow	= 0.9655	TE Check Flow/Noz.Flow	= 0.9757
Assumed LE Flow Coeff.	= 0.9550	Assumed TE Flow Coeff.	= 0.9350

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 8 READING NUMBER 33 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.12	0.	60.60	5.52	2.82	545.03	1337.58	540.85	0.	1221.50
2	65.18	0.	59.61	5.57	2.54	554.42	1316.98	552.48	0.	1194.59
3	62.42	0.	56.01	6.41	1.95	563.13	1216.31	563.12	0.	1078.10
4	60.22	0.	52.56	7.66	1.82	551.17	1107.29	549.58	0.	960.36
5	58.32	0.	49.71	8.61	1.82	526.12	991.76	518.83	0.	840.70
6	56.72	0.	47.11	9.61	1.95	484.04	857.53	464.59	0.	707.85
7	56.27	0.	46.13	10.14	2.24	468.53	815.90	445.72	0.	667.69

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	56.80	42.71	54.80	2.00	9.31	672.39	901.51	493.00	455.12	751.48
2	57.12	40.17	54.42	2.70	8.06	648.49	911.88	494.56	417.56	769.09
3	53.77	41.32	50.68	3.09	8.65	638.78	811.54	479.62	421.72	654.52
4	48.09	43.40	43.79	4.30	12.13	647.24	704.01	470.21	444.65	521.85
5	41.68	45.93	32.15	9.53	14.64	643.64	599.55	446.92	461.69	397.92
6	29.96	49.80	14.29	15.67	26.77	666.34	498.99	427.97	505.63	244.25
7	16.42	53.30	8.00	8.42	39.85	747.97	471.96	443.42	594.81	130.71

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	1221.50	0.500	1.227	0.912	0.453	0.423
2	1194.59	0.509	1.209	0.895	0.423	0.442
3	1078.10	0.517	1.118	0.852	0.448	0.509
4	960.36	0.506	1.016	0.856	0.484	0.560
5	840.70	0.482	0.908	0.861	0.519	0.602
6	707.85	0.442	0.783	0.920	0.555	0.627
7	667.69	0.427	0.744	0.995	0.584	0.621

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1208.60	0.572	0.767	1.3340	0.163	0.033	0.7937	0.8060	0.9833	0.329
2	1162.65	0.554	0.779	1.3690	0.132	0.026	0.8327	0.8429	0.9619	0.349
3	1076.23	0.548	0.697	1.5080	0.072	0.014	0.9119	0.9172	0.9515	0.437
4	968.51	0.538	0.607	1.6840	0.048	0.013	0.9229	0.9274	0.9574	0.516
5	859.61	0.558	0.519	1.9060	0.069	0.013	0.9287	0.9326	0.9464	0.590
6	751.88	0.579	0.434	2.2170	0.081	0.016	0.9333	0.9370	0.9274	0.685
7	725.92	0.652	0.412	2.3390	0.102	0.021	0.9256	0.9298	0.9610	0.716

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.576	1.180	1.545	1.167
2	10.0000	1.557	1.165	1.558	1.163
3	30.0000	1.551	1.153	1.552	1.147
4	50.0000	1.536	1.145	1.523	1.139
5	70.0000	1.494	1.135	1.481	1.128
6	90.0000	1.473	1.132	1.482	1.128
7	95.0000	1.547	1.144	1.494	1.132

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5105	1.5256	1.5338
Adiabatic Efficiency =	0.8706	0.8928	0.8660
Polytropic Efficiency =	0.8779	0.8991	0.8739

Percent Design Speed = 90.0 Discharge Valve Setting= 07.5
Cor. Nozzle Weight Flow= 192.81 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9811 TE Check Flow/Noz.Flow = 0.9547
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

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STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS POINT NUMBER 8 READING NUMBER 33 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG RN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		42.55	39.47	3.08		675.47		497.62	456.76	
2		39.61	39.11	0.50		657.29		506.33	419.08	
3		39.50	39.01	0.49		662.70		511.17	421.31	
4		41.03	39.80	1.23		671.77		505.85	440.23	
5		43.36	40.86	2.50		661.15		478.56	451.93	
6		47.30	42.22	5.08		668.40		449.90	487.51	
7		50.83	42.76	8.07		742.15		465.98	571.07	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DFV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		.0.58	-11.13	11.71	41.97	493.26		493.22	-5.00	
2		-0.40	-10.10	9.70	40.01	550.64		550.90	-3.81	
3		-0.33	-8.87	8.54	39.83	545.90		545.66	-3.15	
4		-0.31	-8.75	8.44	41.34	519.75		519.17	-2.77	
5		-1.33	-9.10	7.77	44.69	479.72		478.57	-11.09	
6		.2.49	-10.58	13.07	44.81	491.55		489.98	21.30	
7		-1.25	-12.36	11.11	52.07	491.44		489.74	-10.64	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.575		0.991	0.489	0.234
2		0.562		1.088	0.370	0.261
3		0.570		1.067	0.372	0.291
4		0.581		1.026	0.414	0.343
5		0.574		1.000	0.459	0.409
6		0.581		1.088	0.431	0.423
7		0.647		1.053	0.521	0.348

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMRN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.416		1.5230	0.151	0.050		0.5199		0.220
2		0.467		1.5440	0.042	0.014		0.8854		0.247
3		0.466		1.6310	0.034	0.010		0.9178		0.275
4		0.445		1.7420	0.023	0.006		0.8636		0.325
5		0.411		1.8800	0.026	0.007		0.8793		0.390
6		0.422		2.0510	0.067	0.016		0.9268		0.403
7		0.421		2.0980	0.097	0.023		0.6967		0.323

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.950	0.989	0.969	1.000
2	10.0000	0.993	0.998	0.992	1.000
3	30.0000	0.994	0.995	0.993	1.000
4	50.0000	0.987	0.995	0.995	1.000
5	70.0000	0.986	0.994	0.995	1.000
6	90.0000	0.992	0.996	0.986	1.000
7	95.0000	0.942	0.989	0.975	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.5105	0.9901	0.9846
Polytropic Efficiency =	0.8779	0.9764	------

Percent Design Speed = 90.0 Discharge Valve Setting= 07.5
Cor. Nozzle Weight Flow= 192.81 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9597 TE Check Flow/Noz.Flow = 0.9725
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

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ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 9 READING NUMBER 34 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.03	0.	60.60	6.43	3.73	521.74	1328.37	517.74	0.	1221.62
2	66.00	0.	59.61	6.39	3.36	533.71	1308.49	531.84	0.	1194.70
3	63.55	0.	56.01	7.54	3.08	536.52	1204.31	536.50	0.	1078.20
4	61.65	0.	52.56	9.09	3.25	519.63	1092.11	518.53	0.	960.45
5	59.57	0.	49.71	9.86	3.07	500.82	978.63	493.88	0.	840.78
6	57.71	0.	47.11	10.60	2.94	466.12	847.59	447.38	0.	707.92
7	56.49	0.	46.13	10.36	2.46	465.19	813.81	442.17	0.	667.75

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.10	45.17	54.80	2.30	9.93	673.16	873.15	473.47	476.43	732.28
2	57.05	42.56	54.42	2.63	8.95	653.56	884.48	480.58	441.23	741.53
3	53.77	43.43	50.68	3.09	9.78	641.32	787.99	465.67	440.78	635.55
4	48.88	45.86	43.79	5.09	12.77	639.26	676.91	445.12	458.72	509.88
5	42.95	48.32	32.15	10.80	16.62	630.39	572.90	418.58	470.08	389.61
6	31.00	51.61	14.29	16.71	24.71	653.92	476.39	403.66	509.40	249.55
7	16.59	54.61	8.00	8.59	39.90	740.21	453.21	425.45	498.89	126.76

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1221.62	0.478	1.216	0.915	0.476	0.436
2	1194.70	0.489	1.199	0.904	0.447	0.454
3	1078.20	0.492	1.104	0.868	0.467	0.521
4	960.45	0.476	1.000	0.859	0.505	0.571
5	840.78	0.458	0.894	0.848	0.542	0.619
6	707.92	0.425	0.772	0.902	0.577	0.667
7	667.75	0.424	0.742	0.962	0.607	0.674

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1208.71	0.570	0.740	1.3346	0.192	0.039	0.7724	0.7866	0.9715	0.341
2	1182.76	0.557	0.754	1.3690	0.155	0.031	0.8156	0.8273	0.9688	0.361
3	1076.33	0.549	0.674	1.5080	0.091	0.018	0.8947	0.9013	0.9462	0.451
4	968.60	0.550	0.582	1.6840	0.091	0.018	0.9019	0.9077	0.9562	0.529
5	859.69	0.544	0.495	1.9060	0.100	0.019	0.9024	0.9077	0.9324	0.611
6	751.95	0.567	0.413	2.2170	0.090	0.017	0.9295	0.9314	0.9092	0.730
7	725.58	0.644	0.394	2.3390	0.118	0.024	0.9161	0.9268	0.9463	0.775

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.604	1.191	1.579	1.181
2	10.0000	1.587	1.173	1.568	1.174
3	30.0000	1.578	1.161	1.574	1.155
4	50.0000	1.549	1.149	1.535	1.145
5	70.0000	1.500	1.139	1.492	1.135
6	90.0000	1.487	1.136	1.494	1.131
7	95.0000	1.567	1.148	1.503	1.135

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5269	1.5457	1.5540
Adiabatic Efficiency =	0.8465	0.8726	0.8570
Polytropic Efficiency =	0.8594	0.8802	0.8656

Percent Design Speed = 90.0 Discharge Valve Setting = 06.0
Cor. Nozzle Weight Flow = 183.44 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9962 TE Check Flow/Noz.Flow = 0.9694
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 9 READING NUMBER 34 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		45.01	39.47	5.54		676.15		478.06	478.15	
2		42.00	39.11	2.89		661.87		491.87	442.84	
3		41.61	39.01	2.60		663.43		495.85	440.36	
4		43.53	39.80	3.73		660.45		478.04	454.16	
5		45.80	40.86	4.94		644.42		447.41	460.14	
6		49.15	42.22	6.93		653.83		424.63	491.15	
7		52.19	42.76	9.43		732.86		446.13	574.92	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.90	-11.13	12.03	44.11	495.55		495.49	.7.77	
2		-0.02	-10.10	10.08	42.02	545.64		545.61	-0.21	
3		0.03	-8.87	8.90	41.57	528.19		527.98	0.32	
4		0.05	-8.75	8.80	43.48	482.21		481.67	0.44	
5		-1.33	-9.10	7.77	47.14	441.97		440.91	-10.25	
6		-4.12	-10.98	14.70	45.04	454.28		451.72	-32.52	
7		-1.97	-12.36	10.39	54.16	451.61		450.09	-15.52	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.573		1.036	0.495	0.256
2		0.564		1.109	0.392	0.285
3		0.569		1.065	0.407	0.313
4		0.569		1.008	0.466	0.379
5		0.557		0.985	0.506	0.462
6		0.567		1.064	0.473	0.461
7		0.637		1.009	0.572	0.367

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.415		1.5230	0.144	0.047		0.5624		0.241
2		0.461		1.5440	0.043	0.014		0.8909		0.269
3		0.449		1.6310	0.045	0.014		0.8645		0.296
4		0.410		1.7420	0.049	0.014		0.8191		0.361
5		0.377		1.8800	0.041	0.011		0.8789		0.444
6		0.388		2.0510	0.066	0.021		0.8973		0.442
7		0.385		2.0980	0.103	0.025		0.6030		0.345

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.956	0.992	0.971	1.000
2	10.0000	0.992	1.000	0.992	1.000
3	30.0000	0.989	0.995	0.991	1.000
4	50.0000	0.981	0.996	0.990	1.000
5	70.0000	0.986	0.996	0.992	1.000
6	90.0000	0.988	0.996	0.983	1.000
7	95.0000	0.934	0.989	0.974	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.5269	0.9878	0.9819
Polytropic Efficiency	=	0.8554	0.9728	------

Percent Design Speed = 90.0 Discharge Valve Setting= 06.0
Cor. Nozzle Weight Flow= 183.44 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9745 TE Check Flow/Noz.Flow = 0.9860
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 1 READING NUMBER 25 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.86	0.	60.60	3.46	0.76	665.73	1512.47	660.43	0.	135R.07
2	62.78	0.	59.61	3.17	0.14	685.51	1494.62	683.11	0.	132R.15
3	59.99	0.	56.01	3.98	-0.48	692.20	1384.14	692.18	0.	119R.63
4	57.60	0.	52.56	5.04	-0.80	679.50	1265.61	677.54	0.	106?.73
5	55.07	0.	49.71	5.36	-1.43	662.07	1145.42	652.89	0.	934.69
6	53.67	0.	47.11	6.56	-1.10	603.00	991.44	578.76	0.	786.99
7	53.35	0.	46.13	7.22	-0.68	581.15	942.76	552.39	0.	742.33

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.77	29.37	54.90	4.97	4.29	678.73	1172.35	589.72	331.86	1011.86
2	59.33	29.04	54.42	4.91	3.45	672.66	1151.00	586.64	329.71	989.15
3	56.07	32.69	50.68	5.39	3.92	668.20	1007.43	562.25	360.75	835.81
4	48.41	37.44	43.79	4.62	9.19	716.72	857.36	569.81	435.60	641.19
5	40.34	37.20	32.15	8.19	14.73	747.73	781.24	594.32	451.06	504.66
6	27.24	41.77	14.29	12.95	26.43	803.82	676.11	593.71	530.25	305.69
7	19.38	46.59	8.00	11.38	33.97	842.16	619.27	572.99	605.23	201.41

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CMI
1	1359.07	0.618	1.405	0.893	0.307	0.323
2	1328.15	0.638	1.392	0.859	0.309	0.345
3	1198.63	0.645	1.290	0.812	0.358	0.401
4	1067.73	0.632	1.176	0.840	0.425	0.438
5	934.69	0.615	1.064	0.910	0.422	0.481
6	786.99	0.556	0.915	1.026	0.442	0.459
7	742.33	0.535	0.868	1.037	0.486	0.436

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAN T RISE	STAT PRESS RISE COEFF
1	1343.72	0.585	1.010	1.3340	0.153	0.029	0.7440	0.7564	0.9255	0.222
2	1314.87	0.582	0.996	1.3690	0.104	0.019	0.8280	0.8371	0.9628	0.243
3	1196.56	0.577	0.870	1.5080	0.103	0.019	0.8444	0.8528	0.9481	0.315
4	1076.79	0.618	0.740	1.6840	0.165	0.033	0.7821	0.7935	0.9443	0.376
5	955.71	0.653	0.683	1.9060	0.057	0.011	0.9311	0.9351	0.9932	0.448
6	835.94	0.704	0.592	2.2170	0.107	0.021	0.8976	0.9034	0.9621	0.492
7	806.63	0.736	0.541	2.3390	0.114	0.023	0.9015	0.9072	0.9642	0.505

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.451	1.155	1.421	1.142
2	10.0000	1.456	1.143	1.468	1.140
3	30.0000	1.465	1.146	1.480	1.141
4	50.0000	1.493	1.160	1.463	1.147
5	70.0000	1.514	1.140	1.512	1.135
6	90.0000	1.527	1.148	1.505	1.138
7	95.0000	1.558	1.163	1.521	1.141

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.4587	1.4811	1.4883
Adiabatic Efficiency =	0.8111	0.8457	0.8082
Polytropic Efficiency =	0.8209	0.8541	0.8187

Percent Design Speed =	100.0	Discharge Valve Setting=	15.0
Cor. Nozzle Weight Flow=	221.89	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9880	TE Check Flow/Noz.Flow =	0.9651
Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500

022770

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 1 READING NUMBER 23 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		29.21	39.47	-10.26		682.44		595.06	333.06	
2		28.50	39.11	-10.61		685.06		602.00	326.90	
3		30.87	39.01	-8.14		702.90		603.03	360.41	
4		34.93	39.80	-4.87		754.81		617.56	431.27	
5		34.38	40.86	-6.48		786.40		645.33	441.52	
6		38.97	42.22	-3.25		820.94		631.97	511.24	
7		47.85	42.76	1.09		846.89		604.78	581.07	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-50.66	-11.13	10.47	29.87	548.52		548.48	-8.74	
2		-51.26	-10.10	8.84	29.77	627.09		626.90	-13.82	
3		-51.81	-8.87	7.06	32.67	643.55		642.97	-20.29	
4		-51.47	-8.79	7.28	36.40	635.94		635.02	-16.31	
5		-52.08	-9.10	7.02	36.46	691.18		689.25	-25.00	
6		-51.56	-10.58	9.02	40.53	719.84		717.35	-19.50	
7		-51.10	-12.36	11.26	44.96	728.06		725.58	-13.98	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.588		0.921	0.359	0.122
2		0.594		1.041	0.245	0.131
3		0.609		1.066	0.250	0.150
4		0.654		1.028	0.327	0.184
5		0.690		1.068	0.277	0.183
6		0.721		1.135	0.278	0.132
7		0.741		1.200	0.305	0.094

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.470		1.5230	0.149	0.049		0.3550		0.113
2		0.541		1.5440	0.073	0.024		0.8216		0.122
3		0.586		1.6310	0.054	0.017		0.9570		0.139
4		0.547		1.7420	0.033	0.009		0.6553		0.169
5		0.602		1.8800	0.045	0.012		0.8179		0.166
6		0.628		2.0510	0.061	0.015		0.5974		0.118
7		0.634		2.0990	0.104	0.025		0.3858		0.083

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.948	0.989	0.968	1.000
2	10.0000	0.993	0.998	0.985	1.000
3	30.0000	0.998	0.995	0.988	1.000
4	50.0000	0.972	0.989	0.992	1.000
5	70.0000	0.986	0.996	0.988	1.000
6	90.0000	0.968	0.991	0.982	1.000
7	95.0000	0.944	0.982	0.967	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.4587	0.9848	0.9796
Polytropic Efficiency =	0.8209	0.9611	------

Percent Design Speed = 100.0 Discharge Valve Setting= 15.0
Cor. Nozzle Weight Flow= 221.89 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9702 TE Check Flow/Noz.Flow = 0.9709
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

522870

ROTOR BLADE R1W - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 5 READING NUMBER 30 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.07	0.	60.60	3.47	0.77	665.82	1512.98	660.71	0.	1358.60
2	62.94	0.	59.61	3.33	0.30	681.03	1493.03	678.65	0.	1328.66
3	60.21	0.	56.01	4.20	-0.26	686.57	1381.74	686.55	0.	1199.10
4	57.91	0.	52.56	5.35	-0.49	671.60	1261.74	669.67	0.	1068.15
5	55.47	0.	49.71	5.76	-1.03	652.37	1140.14	643.33	0.	935.05
6	53.73	0.	47.11	6.62	-1.04	601.91	991.02	577.71	0.	787.30
7	52.55	0.	46.13	6.42	-1.48	598.31	953.66	568.71	0.	749.62

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.97	36.69	54.80	4.17	5.09	698.10	1084.35	558.36	416.04	928.20
2	58.90	34.59	54.42	4.48	4.04	682.10	1085.86	560.32	386.35	929.03
3	53.35	38.44	50.68	2.67	6.86	715.11	938.20	560.03	444.45	752.58
4	48.65	40.46	43.79	4.86	9.27	711.66	819.78	541.54	461.88	615.33
5	41.03	41.14	32.15	8.88	14.44	729.47	728.18	548.25	479.03	477.06
6	30.05	45.73	14.29	15.76	23.48	752.54	609.29	521.26	534.77	301.50
7	19.97	50.00	8.00	11.97	32.58	814.88	563.23	518.93	618.35	184.59

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1358.60	0.618	1.405	0.845	0.386	0.393
2	1328.66	0.634	1.389	0.826	0.367	0.412
3	1199.10	0.639	1.287	0.816	0.428	0.471
4	1068.15	0.624	1.173	0.809	0.459	0.517
5	935.05	0.635	1.057	0.852	0.472	0.556
6	787.30	0.595	0.914	0.902	0.510	0.561
7	749.62	0.559	0.879	0.912	0.554	0.558

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN MEAN T RISE	RISE	STAT PRESS COEFF
1	1344.24	0.593	0.921	1.3340	0.153	0.030	0.7835	0.7967	0.9405		0.283
2	1315.38	0.585	0.931	1.3690	0.117	0.022	0.8355	0.8459	0.9860		0.303
3	1197.02	0.613	0.804	1.5080	0.098	0.019	0.8741	0.8823	0.9833		0.382
4	1077.21	0.612	0.704	1.6840	0.123	0.024	0.8529	0.8620	0.9547		0.454
5	956.08	0.633	0.632	1.9060	0.055	0.011	0.9384	0.9422	0.9757		0.525
6	836.27	0.655	0.530	2.2170	0.118	0.023	0.8924	0.8988	0.9562		0.597
7	806.95	0.708	0.489	2.3390	0.136	0.027	0.8858	0.8926	0.9511		0.627

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.592	1.191	1.561	1.174
2	10.0000	1.584	1.166	1.591	1.170
3	30.0000	1.622	1.174	1.620	1.149
4	50.0000	1.593	1.168	1.572	1.142
5	70.0000	1.574	1.155	1.571	1.147
6	90.0000	1.545	1.120	1.536	1.147
7	95.0000	1.603	1.169	1.546	1.150

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5630	1.5805	1.5905
Adiabatic Efficiency =	0.8461	0.8686	0.8533
Polytropic Efficiency =	0.8555	0.8769	0.8626

Percent Design Speed = 100.1 Discharge Valve Setting= 11.0

Cor. Nozzle Weight Flow= 219.33 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9959 TE Check Flow/Noz.Flow = 0.9744

Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 2 NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 5 READING NUMBER 30 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHAR LN LE ANGLE	INCID ANG MN CHAR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		36.52	39.47	-2.95		701.59		563.80	417.54	
2		34.02	39.11	-5.09		693.11		574.46	387.76	
3		36.49	39.01	-2.52		747.00		600.27	444.02	
4		37.97	39.80	-1.83		744.70		585.96	457.28	
5		38.39	40.86	-2.47		759.04		591.92	468.90	
6		43.07	42.22	0.85		761.71		551.44	515.60	
7		47.38	42.76	4.62		813.76		546.32	593.68	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHAR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-1.73	-11.13	9.40	38.26	532.59		532.34	-16.10	
2		-2.61	-10.10	7.49	36.63	603.32		602.66	-27.45	
3		.0.91	-8.87	9.78	35.58	629.63		629.29	-10.03	
4		-1.74	-8.75	7.01	39.71	592.17		591.24	-17.97	
5		-1.70	-9.10	7.40	40.09	605.25		603.49	-17.92	
6		-1.69	-10.58	8.89	44.76	594.13		592.05	-17.48	
7		-2.46	-12.36	9.90	49.84	590.83		587.89	-25.31	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.596		0.944	0.444	0.203
2		0.595		1.049	0.323	0.226
3		0.642		1.048	0.335	0.243
4		0.642		1.009	0.387	0.298
5		0.661		1.020	0.372	0.333
6		0.663		1.073	0.388	0.334
7		0.707		1.076	0.453	0.284

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.449		1.5230	0.145	0.047		0.4929		0.189
2		0.512		1.5440	0.043	0.014		0.9228		0.211
3		0.536		1.6310	0.044	0.014		0.8501		0.225
4		0.504		1.7420	0.023	0.007		0.8208		0.278
5		0.520		1.8800	0.025	0.007		0.9227		0.310
6		0.510		2.0510	0.040	0.010		0.8617		0.311
7		0.505		2.0980	0.083	0.020		0.6173		0.260

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.950	0.985	0.968	1.000
2	10.0000	0.995	1.004	0.991	1.000
3	30.0000	0.988	0.996	0.989	1.000
4	50.0000	0.981	0.995	0.994	1.000
5	70.0000	0.991	0.996	0.994	1.000
6	90.0000	0.984	0.997	0.990	1.000
7	95.0000	0.941	0.984	0.976	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.5630	0.9889	0.9825
Polytropic Efficiency =	0.8555	0.9757	------

Percent Design Speed = 100.1 Discharge Valve Setting= 11.0
Cor. Nozzle Weight Flow= 219.33 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9795 TE Check Flow/Noz.Flow.= 0.9784
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 2 READING NUMBER 27 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.60	0.	60.60	4.00	1.30	649.95	1505.62	644.97	0.	1358.11
2	63.32	0.	59.61	3.71	0.68	669.66	1487.45	667.31	0.	1328.19
3	60.77	0.	56.01	4.76	0.30	670.63	1373.52	670.41	0.	1198.67
4	58.63	0.	52.56	6.07	0.23	652.98	1251.60	651.10	0.	1067.77
5	56.04	0.	49.71	6.33	-0.46	638.39	1131.92	629.54	0.	934.72
6	54.35	0.	47.11	7.24	-0.42	588.10	982.47	564.46	0.	787.01
7	53.47	0.	46.13	7.34	-0.56	578.47	941.13	549.85	0.	742.36

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV AVR TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.72	40.90	54.80	9.92	6.88	727.48	1028.42	548.99	475.26	868.50
2	57.54	38.28	54.42	3.12	5.78	710.77	1038.47	556.81	439.48	875.43
3	52.07	41.63	50.68	1.39	8.70	737.21	896.34	550.90	489.68	706.91
4	49.17	43.84	43.79	5.38	9.45	705.07	777.83	508.47	488.31	588.51
5	41.37	43.83	32.15	9.22	14.67	721.02	693.19	519.18	494.46	457.28
6	32.42	48.73	14.29	18.13	21.93	719.05	564.28	471.62	536.78	299.18
7	18.91	53.25	8.00	10.91	34.56	808.81	517.35	479.65	642.31	164.35

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1358.11	0.603	1.396	0.851	0.434	0.426
2	1328.19	0.622	1.382	0.834	0.409	0.448
3	1198.67	0.623	1.277	0.821	0.465	0.510
4	1067.77	0.606	1.161	0.781	0.495	0.559
5	934.72	0.591	1.048	0.825	0.504	0.607
6	787.01	0.542	0.905	0.834	0.552	0.628
7	742.36	0.532	0.866	0.872	0.603	0.628

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1343.76	0.614	0.868	1.3340	0.165	0.033	0.7909	0.8052	0.9706	0.313
2	1314.91	0.605	0.884	1.3690	0.129	0.025	0.8361	0.8477	0.9932	0.336
3	1196.60	0.627	0.763	1.5040	0.094	0.019	0.8890	0.8971	0.9682	0.421
4	1076.82	0.603	0.665	1.6840	0.102	0.020	0.8848	0.8925	0.9548	0.499
5	956.74	0.621	0.598	1.9060	0.058	0.012	0.9380	0.9420	0.9409	0.580
6	835.97	0.622	0.488	2.2170	0.118	0.022	0.8970	0.9033	0.9261	0.671
7	806.66	0.699	0.448	2.3390	0.146	0.029	0.8844	0.8916	0.9465	0.706

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.694	1.212	1.659	1.197
2	10.0000	1.684	1.187	1.681	1.192
3	30.0000	1.715	1.195	1.704	1.185
4	50.0000	1.648	1.177	1.632	1.170
5	70.0000	1.621	1.163	1.604	1.154
6	90.0000	1.563	1.156	1.561	1.142
7	95.0000	1.653	1.176	1.572	1.157

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.6239	1.6463	1.6611
Adiabatic Efficiency =	0.8518	0.8776	0.8607
Polytropic Efficiency =	0.8616	0.8859	0.8703

Percent Design Speed = 100.0 Discharge Valve Setting= 09.0
Cor. Nozzle Weight Flow= 217.17 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9908 TE Check Flow/Noz.Flow = 0.9719
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

822770

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 2 READING NUMBER 27 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		40.73	39.47	-1.26		730.96		553.88	476.98	
2		37.70	39.11	-1.41		721.35		570.75	441.08	
3		39.67	39.01	0.66		766.66		589.86	489.21	
4		41.39	39.80	1.59		732.41		548.48	483.46	
5		41.12	40.86	0.26		745.44		558.67	487.92	
6		46.16	42.22	3.94		723.18		496.97	517.55	
7		50.74	42.76	7.98		802.90		504.90	616.67	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-2.43	-11.13	8.70	43.17	533.99		533.51	-22.67	
2		-2.40	-10.10	7.70	40.10	597.02		596.46	-25.02	
3		-1.58	-8.87	10.45	38.09	620.51		620.02	-17.10	
4		-1.41	-8.75	7.34	42.81	554.94		553.76	-13.65	
5		-1.38	-9.10	7.72	42.50	536.63		535.33	-17.85	
6		-0.23	-10.58	10.35	44.39	513.27		511.68	-2.08	
7		-2.51	-12.36	9.85	53.24	504.55		502.45	-21.99	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.617		0.963	0.494	0.241
2		0.615		1.045	0.381	0.263
3		0.655		1.051	0.379	0.277
4		0.628		1.010	0.436	0.353
5		0.644		0.958	0.457	0.402
6		0.626		1.030	0.462	0.445
7		0.694		0.997	0.557	0.360

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.446		1.5230	0.154	0.050		0.5289		0.224
2		0.502		1.5440	0.053	0.017		0.8320		0.246
3		0.524		1.6310	0.047	0.014		0.8178		0.256
4		0.469		1.7420	0.036	0.010		0.8418		0.333
5		0.456		1.8800	0.041	0.011		0.8453		0.378
6		0.436		2.0510	0.052	0.013		0.9029		0.422
7		0.428		2.0980	0.092	0.092		0.6103		0.334

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.945	0.988	0.964	1.000
2	10.0000	0.986	1.004	0.988	1.000
3	30.0000	0.989	0.992	0.988	1.000
4	50.0000	0.982	0.994	0.992	1.000
5	70.0000	0.979	0.993	0.990	1.000
6	90.0000	0.987	0.996	0.988	1.000
7	95.0000	0.926	0.983	0.974	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =		1.6239	0.9863	0.9768
Polytropic Efficiency =		0.8616	0.9725	------
Percent Design Speed =	100.0	Discharge Valve Setting=		09.0
Cor. Nozzle Weight Flow=	217.17	Vane Schedule =		0.0
LE Check Flow/Noz.Flow =	0.9770	TE Check Flow/Noz.Flow =		0.9705
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =		0.9350

822870

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 4 READING NUMBER 29 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.17	[illegible]	60.60	4.57	1.87	633.92	1499.01	628.46	0.	1358.56
2	64.27	[illegible]	59.61	4.66	1.63	642.65	1475.88	640.39	0.	1328.62
3	61.74	[illegible]	56.01	5.73	1.27	644.64	1361.36	644.43	0.	1199.06
4	60.00	[illegible]	52.56	7.44	1.60	618.58	1234.31	616.80	0.	1068.12
5	57.88	[illegible]	49.71	8.17	1.38	595.16	1108.37	586.91	0.	935.02
6	56.00	[illegible]	47.11	8.89	1.23	553.20	962.20	530.96	0.	787.27
7	54.80	[illegible]	46.13	8.67	0.77	551.08	924.74	523.81	0.	749.60

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	56.54	44.04	54.80	1.74	8.63	755.58	984.21	542.06	524.14	820.06
2	57.05	41.40	54.42	2.63	7.22	724.58	998.49	542.56	478.96	837.08
3	59.78	44.54	50.68	2.10	8.96	730.10	860.25	520.97	512.03	684.95
4	48.99	46.40	43.79	5.20	11.00	710.01	746.22	489.57	514.11	569.06
5	41.85	47.35	32.15	9.70	16.03	713.31	649.02	482.50	523.83	432.22
6	34.68	52.36	14.29	20.59	21.12	690.83	516.69	419.40	543.85	292.39
7	17.97	54.67	8.00	9.97	36.83	810.86	498.93	465.02	456.12	150.80

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1358.56	0.586	1.387	0.862	0.474	0.451
2	1328.62	0.595	1.367	0.847	0.441	0.470
3	1199.06	0.497	1.262	0.807	0.493	0.536
4	1068.12	0.572	1.141	0.794	0.520	0.585
5	935.02	0.549	1.022	0.822	0.539	0.638
6	787.27	0.508	0.883	0.790	0.594	0.685
7	749.60	0.506	0.849	0.888	0.619	0.681

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1344.20	0.633	0.825	1.3340	[illegible]142	0.038	0.7886	0.8644	0.9654	0.337
2	1315.34	0.612	0.844	1.3690	[illegible]136	0.027	0.8409	0.8831	0.9734	0.358
3	1196.99	0.619	0.729	1.5080	[illegible]101	0.020	0.8872	0.8957	0.9714	0.449
4	1077.17	0.605	0.636	1.6840	[illegible]101	0.020	0.8945	0.9070	0.9552	0.528
5	956.05	0.612	0.557	1.9060	[illegible]065	0.013	0.9358	0.9402	0.9453	0.618
6	836.24	0.595	0.445	2.2170	[illegible]116	0.021	0.9062	0.9122	0.9249	0.738
7	806.92	0.698	0.430	2.3390	[illegible]159	0.032	0.8821	0.8897	0.9148	0.770

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.781	1.235	1.738	1.218
2	10.0000	1.754	1.208	1.758	1.208
3	30.0000	1.761	1.203	1.750	1.196
4	50.0000	1.702	1.186	1.689	1.18[illegible]
5	70.0000	1.661	1.170	1.640	1.163
6	90.0000	1.586	1.158	1.630	1.159
7	95.0000	1.702	1.186	1.601	1.164

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.6761	1.7020	1.7144
Adiabatic Efficiency =	0.8304	0.8776	0.8630
Polytropic Efficiency =	0.8609	0.8865	0.8730

Percent Design Speed = 100.1 Discharge Valve Setting= 7.5
Cor. Nozzle Weight Flow= 212.65 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9793 TE Check Flow/Noz.Flow = 0.9653
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

022870

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 4 READING NUMBER 29 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		43.87	39.47	4.40		759.07		547.24	526.04	
2		40.81	39.11	1.70		734.50		555.93	480.00	
3		42.63	39.01	3.62		755.63		555.74	511.94	
4		43.99	39.80	4.19		734.01		527.23	509.00	
5		44.72	40.86	3.86		731.84		517.82	517.76	
6		49.90	42.22	7.68		690.14		441.48	524.36	
7		52.21	42.76	9.45		802.73		488.41	629.93	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-1.31	-11.13	9.82	45.17	552.20		552.05	-12.58	
2		-1.29	-10.10	8.81	42.09	609.49		609.30	-13.69	
3		0.61	-8.87	9.48	42.02	601.97		601.49	6.37	
4		0.63	-8.75	9.38	43.36	543.33		542.69	5.97	
5		1.21	-9.10	10.31	43.51	499.08		497.90	10.51	
6		2.10	-10.58	12.68	47.40	461.85		460.15	16.90	
7		-4.04	-12.36	8.32	56.25	456.20		453.61	-32.03	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.636		1.009	0.505	0.256
2		0.621		1.096	0.388	0.278
3		0.642		1.083	0.408	0.295
4		0.627		1.029	0.455	0.379
5		0.629		0.962	0.499	0.432
6		0.594		1.042	0.507	0.503
7		0.691		0.929	0.625	0.387

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.458		1.5230	0.131	0.043		0.9583		0.238
2		0.509		1.5440	0.047	0.015		0.8941		0.260
3		0.505		1.6310	0.049	0.015		0.8197		0.275
4		0.457		1.7420	0.048	0.014		0.8461		0.357
5		0.422		1.8800	0.059	0.016		0.8172		0.409
6		0.390		2.0510	0.097	0.024		0.9133		0.482
7		0.384		2.0980	0.098	0.023		0.5850		0.360

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.945	0.986	0.968	1.000
2	10.0000	0.991	1.000	0.989	1.000
3	30.0000	0.981	0.994	0.988	1.000
4	50.0000	0.981	0.995	0.989	1.000
5	70.0000	0.974	0.993	0.986	1.000
6	90.0000	0.988	1.001	0.980	1.000
7	95.0000	0.914	0.981	0.971	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.6761	0.9847	0.9762
Polytropic Efficiency =	0.8609	0.9711	------

Percent Design Speed = 100.1 Discharge Valve Setting= 7.5
Cor. Nozzle Weight Flow= 212.65 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9704 TE Check Flow/Noz.Flow = 0.9885
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

822870

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW 2 NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 3 READING NUMBER 28 DATE 9/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.37	0.	60.60	5.77	3.07	598.79	1484.18	594.90	0.	1358.03
2	65.41	0.	59.61	5.80	2.77	609.88	1461.44	607.74	0.	1328.11
3	61.94	0.	56.01	5.93	1.47	638.94	1358.26	638.92	0.	1198.59
4	62.13	0.	52.56	9.57	3.73	566.24	1208.56	564.41	0.	1067.70
5	59.19	0.	49.71	9.48	2.69	565.15	1092.24	557.32	0.	934.66
6	57.63	0.	47.11	10.52	2.86	519.75	943.11	498.86	0.	786.97
7	56.56	0.	46.13	10.43	2.53	515.66	903.84	490.14	0.	742.31

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	56.17	48.16	54.80	1.37	10.20	773.48	926.28	515.08	575.19	768.49
2	56.09	45.15	54.42	1.67	9.32	749.13	946.35	527.46	530.26	784.57
3	53.34	44.57	50.68	2.66	8.60	725.36	835.13	498.58	526.69	669.84
4	48.59	49.06	43.79	4.80	13.54	718.65	711.98	470.85	542.81	533.94
5	43.09	49.66	32.15	10.94	16.11	699.78	620.48	452.32	532.61	423.07
6	36.20	54.84	14.29	21.91	21.43	678.17	486.43	388.52	551.53	284.39
7	17.70	56.06	8.00	9.70	38.86	806.06	478.72	446.83	664.00	142.61

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1358.03	0.552	1.369	0.867	0.520	0.459
2	1328.11	0.563	1.349	0.868	0.484	0.477
3	1198.59	0.592	1.258	0.780	0.514	0.558
4	1067.70	0.520	1.111	0.834	0.545	0.596
5	934.66	0.519	1.004	0.812	0.561	0.662
6	786.97	0.476	0.863	0.779	0.620	0.719
7	742.31	0.472	0.827	0.912	0.634	0.733

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1343.68	0.644	0.771	1.3340	0.207	0.043	0.7761	0.7938	0.9799	0.346
2	1314.83	0.629	0.794	1.3690	0.173	0.035	0.8110	0.8240	0.9759	0.367
3	1196.52	0.612	0.705	1.5080	0.119	0.024	0.8722	0.8822	0.9668	0.471
4	1076.76	0.609	0.604	1.6840	0.110	0.022	0.8916	0.8996	0.9461	0.544
5	955.68	0.598	0.530	1.9060	0.086	0.016	0.9203	0.9258	0.9276	0.646
6	835.92	0.582	0.417	2.2170	0.126	0.023	0.9039	0.9103	0.9121	0.781
7	806.61	0.692	0.411	2.3390	0.186	0.038	0.8782	0.8787	0.9007	0.835

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.635	1.254	1.801	1.236
2	10.0000	1.811	1.230	1.804	1.227
3	30.0000	1.792	1.210	1.779	1.205
4	50.0000	1.745	1.199	1.723	1.189
5	70.0000	1.678	1.176	1.660	1.170
6	90.0000	1.605	1.163	1.620	1.164
7	95.0000	1.743	1.191	1.611	1.168

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.7037	1.7377	1.7517
Adiabatic Efficiency =	0.8281	0.8613	0.8505
Polytropic Efficiency =	0.8405	0.8717	0.8619

Percent Design Speed = 100.0 Discharge Valve Setting= 6.0
Cor. Nozzle Weight Flow= 204.03 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0773 TE Check Flow/Noz.Flow = 0.9718
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

822870

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 3 READING NUMBER 28 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		47.99	39.47	8.52		776.89		519.91	577.27	
2		44.57	39.11	5.46		758.36		540.24	532.18	
3		44.70	39.01	5.69		748.36		531.75	526.18	
4		44.70	39.80	4.90		739.45		506.35	537.41	
5		47.10	40.86	6.24		714.44		484.42	521.35	
6		52.47	42.22	10.25		674.64		408.48	531.76	
7		53.66	42.76	10.90		796.67		469.00	637.90	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.22	-11.13	10.91	48.21	573.87		573.86	-2.18	
2		-0.19	-10.10	9.91	44.76	616.13		616.10	-2.03	
3		1.01	-8.87	9.88	43.69	586.77		586.44	10.30	
4		1.09	-8.75	9.77	45.68	529.51		528.84	9.45	
5		1.01	-9.10	10.11	46.09	470.42		469.34	8.31	
6		3.18	-10.58	13.76	49.29	419.69		417.76	23.18	
7		-3.78	-12.36	8.58	57.44	408.84		406.64	-26.85	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.647		1.104	0.506	0.251
2		0.637		1.140	0.415	0.278
3		0.633		1.103	0.427	0.296
4		0.628		1.044	0.487	0.363
5		0.612		0.969	0.531	0.453
6		0.579		1.023	0.598	0.530
7		0.684		0.867	0.682	0.380

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOWEN RISE/ MEAN RISE	STAT PRESS RISE COEFF
1		0.473		1.5230	0.144	0.047		0.9644		0.233
2		0.511		1.5440	0.051	0.017		0.9844		0.259
3		0.490		1.6310	0.068	0.021		0.9742		0.276
4		0.443		1.7420	0.081	0.023		0.9552		0.341
5		0.396		1.8809	0.075	0.020		0.9682		0.431
6		0.353		2.0510	0.138	0.034		0.9675		0.510
7		0.343		2.0980	0.105	0.025		0.9586		0.354

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.946	0.986	0.964	1.000
2	10.0000	0.984	0.998	0.988	1.000
3	30.0000	0.976	0.997	0.984	1.000
4	50.0000	0.968	0.992	0.981	1.000
5	70.0000	0.972	0.994	0.983	1.000
6	90.0000	0.981	1.001	0.972	1.000
7	95.0000	0.896	0.981	0.970	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.7037	0.9804	0.9698
Polytropic Efficiency	=	0.8405	0.9751	------

Percent Design Speed =	100.0	Discharge Valve Setting=	6.0
Cor. Nozzle Weight Flow=	204.03	Vane Schedule =	0.0

LE Check Flow/Noz.Flow =	0.9769	TE Check Flow/Noz.Flow =	1.0139
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 804 • NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 12 READING NUMBER 72 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG BODY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.41	0.	60.60	3.81	1.11	722.08	1661.22	716.54	0.	1496.08
2	63.37	0.	59.61	3.76	0.73	736.17	1637.88	733.59	0.	1463.12
3	60.71	0.	56.01	4.70	0.24	740.73	1514.02	740.71	0.	1320.44
4	58.59	0.	52.56	6.03	0.19	720.35	1379.29	718.28	0.	1176.24
5	56.26	0.	49.71	6.55	-0.24	697.47	1243.66	687.80	0.	1029.68
6	54.59	0.	47.11	7.48	-0.18	642.04	1078.82	616.24	0.	866.97
7	53.54	0.	46.13	7.41	0.69	635.74	1035.92	604.28	0.	817.77

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	61.35	33.25	54.80	6.55	3.06	713.99	1243.03	595.42	390.43	1089.85
2	60.42	30.45	54.42	6.00	2.95	716.77	1249.87	616.44	362.36	1086.14
3	56.53	34.60	50.68	5.85	4.18	727.33	1085.40	598.59	412.87	905.29
4	49.56	38.68	43.79	5.77	9.03	769.91	926.60	600.96	481.06	705.16
5	41.96	39.62	32.15	9.81	14.29	793.00	821.40	609.60	504.64	548.19
6	29.41	43.73	14.29	15.12	25.19	845.19	783.70	605.77	579.44	341.45
7	22.56	48.35	8.00	14.56	36.98	877.11	636.97	577.03	648.89	239.72

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1496.08	0.675	1.554	0.831	0.339	0.338
2	1463.12	0.690	1.535	0.846	0.317	0.355
3	1320.44	0.694	1.419	0.808	0.373	0.413
4	1176.24	0.674	1.290	0.837	0.432	0.447
5	1029.68	0.650	1.180	0.886	0.447	0.490
6	866.97	0.595	0.999	0.983	0.472	0.481
7	817.77	0.589	0.959	0.955	0.525	0.463

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1480.28	0.601	1.047	1.3346	0.210	0.038	0.6891	0.7070	0.8753	0.221
2	1448.50	0.609	1.063	1.3690	0.151	0.029	0.7622	0.7769	0.8785	0.238
3	1318.16	0.621	0.927	1.5080	0.125	0.023	0.8287	0.8398	0.9498	0.312
4	1186.22	0.657	0.791	1.6840	0.187	0.036	0.7653	0.7795	0.9398	0.373
5	1052.84	0.683	0.707	1.9060	0.125	0.024	0.8615	0.8706	0.9377	0.448
6	920.89	0.733	0.611	2.2170	0.142	0.028	0.8740	0.8825	0.9525	0.508
7	888.61	0.759	0.551	2.3390	0.178	0.035	0.8497	0.8594	0.9579	0.524

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.558	1.212	1.523	1.186
2	10.0000	1.572	1.192	1.571	1.181
3	30.0000	1.606	1.184	1.613	1.177
4	50.0000	1.623	1.195	1.556	1.176
5	70.0000	1.628	1.182	1.617	1.171
6	90.0000	1.636	1.180	1.640	1.174
7	95.0000	1.649	1.194	1.607	1.171

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5656	1.5920	1.6091
Adiabatic Efficiency =	0.7764	0.8074	0.7685
Polytropic Efficiency =	0.7901	0.8196	0.7835

Percent Design Speed = 110.2 Discharge Valve Setting= 13.0
Cor. Nozzle Weight Flow= 230.69 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9878 TE Check Flow/Noz.Flow = 0.9901
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE 2DN • NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 12 READING NUMBER 72 DATE 8/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SOCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		33.69	39.47	-6.38		717.76		601.36	391.84	
2		29.88	39.11	-9.23		789.97		632.90	363.67	
3		32.65	39.91	-6.36		764.97		643.77	412.47	
4		36.05	39.80	-3.75		810.88		654.25	476.27	
5		36.71	40.86	-4.15		830.92		662.58	493.98	
6		40.88	42.22	-1.34		861.58		645.33	558.67	
7		45.62	42.76	2.86		879.63		609.58	622.99	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.95	-11.13	10.18	34.04	529.84		529.46	-8.81	
2		-0.91	-10.10	9.19	30.79	420.42		420.31	-9.88	
3		-0.44	-8.87	9.31	32.20	655.46		655.16	5.07	
4		-1.67	-8.75	7.08	37.72	607.99		607.06	-17.70	
5		-0.85	-9.10	8.25	37.56	686.43		684.89	-10.18	
6		0.81	-10.50	11.39	40.08	726.39		724.08	10.19	
7		-1.50	-12.36	10.86	47.13	696.95		694.47	-18.22	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1		0.605		0.880	0.445	0.207
2		0.621		0.980	0.316	0.221
3		0.656		1.018	0.306	0.228
4		0.696		0.928	0.424	0.263
5		0.719		1.036	0.334	0.266
6		0.749		1.122	0.309	0.219
7		0.762		1.139	0.378	0.211

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.444		1.5230	0.160	0.092		0.4721		0.193
2		0.525		1.5440	0.056	0.018		0.8262		0.206
3		0.558		1.6310	0.056	0.017		0.8738		0.210
4		0.515		1.7420	0.040	0.011		0.6200		0.241
5		0.587		1.8800	0.032	0.008		0.8587		0.242
6		0.623		2.0510	0.089	0.022		0.7703		0.196
7		0.597		2.0980	0.099	0.024		0.5930		0.169

RADIAL POSITION	PERCENT INCEPSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.943	0.978	0.964	1.000
2	10.0000	0.987	0.991	0.987	1.000
3	50.0000	0.990	0.994	0.986	1.000
4	90.0000	0.947	0.984	0.966	1.000
5	70.0000	0.984	0.991	0.991	1.000
6	90.0000	0.975	0.995	0.972	1.000
7	95.0000	0.943	0.981	0.968	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.5656	0.9834	0.9724
Polytropic Efficiency =	0.7901	0.9640	------

Percent Design Speed = 110.2 Discharge Valve Setting= 13.0
Cor. Nozzle Weight Flow= 230.69 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9953 TE Check Flow/Noz.Flow = 0.9684
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 50W - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 8 READING NUMBER 57 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.43	0.	60.60	3.83	1.13	719.70	1657.01	714.18	0.	1492.55
2	63.26	0.	59.61	3.65	8.62	737.98	1635.61	735.39	0.	1459.66
3	60.68	0.	56.01	4.67	8.21	739.96	1510.92	739.94	0.	1317.32
4	58.46	0.	52.56	5.90	8.06	722.22	1377.90	720.14	0.	1173.47
5	56.12	0.	49.71	6.41	*0.38	699.48	1242.78	689.78	0.	1027.25
6	54.53	0.	47.11	7.42	*8.24	642.81	1077.16	616.20	0.	864.92
7	53.42	0.	46.13	7.29	*9.61	637.03	1035.09	605.51	0.	815.84

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.36	42.48	54.80	5.56	4.07	790.66	1118.15	552.11	505.87	970.92
2	59.15	38.61	54.42	4.73	4.11	749.32	1140.61	584.37	466.67	978.41
3	54.58	39.57	50.68	3.90	6.10	764.32	1016.53	589.09	486.75	828.29
4	48.59	42.82	43.79	4.80	9.87	783.07	868.33	574.26	532.22	651.20
5	40.66	43.01	32.15	8.51	13.46	803.20	774.31	586.25	546.87	503.48
6	34.64	48.68	14.29	20.35	19.89	766.24	647.30	502.48	571.51	347.21
7	24.49	52.11	8.00	16.49	15.93	836.48	570.28	509.36	654.46	232.04

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1492.55	0.673	1.549	0.773	0.439	0.404
2	1459.66	0.692	1.533	0.795	0.406	0.425
3	1317.32	0.694	1.416	0.796	0.434	0.488
4	1173.47	0.675	1.289	0.797	0.485	0.534
5	1027.25	0.652	1.159	0.858	0.493	0.584
6	864.92	0.595	0.998	0.815	0.550	0.609
7	815.84	0.590	0.958	0.841	0.590	0.620

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1476.78	0.623	0.928	1.3348	0.227	0.042	0.7167	0.7371	0.9409	0.277
2	1445.08	0.630	0.959	1.3698	0.192	0.036	0.7617	0.7795	0.9619	0.298
3	1315.05	0.645	0.858	1.5088	0.126	0.024	0.8503	0.8618	0.9413	0.383
4	1183.42	0.664	0.736	1.6846	0.152	0.030	0.8324	0.8448	0.9417	0.458
5	1050.35	0.687	0.662	1.9060	0.093	0.018	0.9057	0.9128	0.9195	0.545
6	918.72	0.658	0.530	2.2170	0.147	0.027	0.8731	0.8819	0.9220	0.643
7	886.51	0.716	0.488	2.3398	0.176	0.034	0.8580	0.8677	0.9057	0.691

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.743	1.255	1.701	1.229
2	10.0000	1.756	1.225	1.748	1.226
3	30.0000	1.789	1.219	1.770	1.209
4	50.0000	1.774	1.215	1.726	1.203
5	70.0000	1.760	1.201	1.735	1.189
6	90.0000	1.654	1.183	1.664	1.180
7	95.0000	1.731	1.26[illegible]	1.653	1.1[illegible]

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.7045	1.7298	1.7556
Adiabatic Efficiency =	0.8079	0.8320	0.8129
Polytropic Efficiency =	0.8218	0.8445	0.8271

Percent Design Speed = 110.0 Discharge Valve Setting= 9.0
Cor. Nozzle Weight Flow= 229.89 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9918 TE Check Flow/Noz.Flow = 0.9985
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 8 READING NUMBER 67 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG BODY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		42.31	39.47	2.84		794.19		557.71	567.69	
2		38.81	39.11	-1.18		760.65		599.33	468.36	
3		37.95	39.01	-1.46		798.25		632.58	486.29	
4		40.22	39.80	0.42		817.49		623.03	526.93	
5		40.13	40.86	-0.73		834.69		635.10	535.31	
6		46.06	42.22	3.84		771.34		531.06	551.02	
7		49.54	42.76	6.78		832.40		539.93	628.35	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-2.64	-11.13	8.49	44.95	518.87		518.01	-23.86	
2		-1.21	-10.10	8.89	39.22	585.53		585.37	-12.38	
3		0.55	-8.87	9.42	37.80	619.21		618.92	5.96	
4		-1.05	-8.75	7.70	41.27	588.71		587.96	-10.76	
5		0.25	-9.10	9.35	39.88	606.09		604.79	2.42	
6		0.64	-10.98	11.22	45.42	549.26		547.48	6.07	
7		-4.12	-12.36	8.24	53.68	526.28		523.24	-37.65	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.626		0.929	0.544	0.307
2		0.640		0.977	0.435	0.315
3		0.677		0.978	0.408	0.310
4		0.696		0.944	0.467	0.371
5		0.716		0.952	0.442	0.302
6		0.662		1.031	0.457	0.441
7		0.713		0.976	0.555	0.369

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.427		1.5238	0.132	0.043		0.6005		0.287
2		0.485		1.5448	0.068	0.022		0.7781		0.294
3		0.518		1.6318	0.047	0.014		0.8135		0.295
4		0.492		1.7428	0.022	0.006		0.7847		0.344
5		0.511		1.8808	0.039	0.010		0.8441		0.363
6		0.462		2.0518	0.081	0.020		0.9005		0.415
7		0.442		2.0988	0.098	0.023		0.6313		0.341

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.946	0.979	0.969	1.000
2	10.0000	0.975	1.000	0.988	1.000
3	30.0000	0.977	0.992	0.987	1.000
4	50.0000	0.966	0.998	0.994	1.000
5	80.0000	0.974	0.990	0.989	1.000
6	90.0000	0.985	0.997	0.979	1.000
7	95.0000	0.927	0.979	0.971	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.7045	0.9853	0.9701
Polytropic Efficiency =	0.8218	0.9731	------

Percent Design Speed = 110.0 Discharge Valve Setting= 9.0
Cor. Nozzle Weight Flow= 229.89 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0037 TE Check Flow/Noz.Flow = 0.9679
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 80W - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 11 READING NUMBER 71 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG BODY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.65	0.	60.60	4.05	1.35	713.33	1655.70	707.86	0.	1494.15
2	63.52	0.	59.61	3.91	0.88	736.60	1633.70	728.04	0.	1461.23
3	60.75	0.	56.01	4.74	0.28	738.47	1511.43	738.46	0.	1318.74
4	58.73	0.	52.56	6.17	0.33	715.43	1375.44	713.37	0.	1174.72
5	56.39	0.	49.71	6.68	0.11	693.20	1240.17	683.59	0.	1028.35
6	54.91	0.	47.11	7.80	0.14	633.78	1073.02	608.31	0.	865.85
7	53.93	0.	46.13	7.80	0.10	625.98	1029.02	595.00	0.	816.72

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANG TE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	61.58	47.42	54.80	6.78	3.07	745.89	1058.82	503.54	548.03	930.33
2	58.15	39.72	54.42	3.73	5.37	772.13	1124.33	592.79	492.45	954.18
3	53.20	41.34	50.68	2.52	7.55	791.26	991.61	593.95	522.56	793.90
4	48.93	43.95	43.79	5.14	9.80	779.45	854.06	561.07	540.91	643.78
5	41.10	44.79	32.15	8.95	15.28	795.74	749.62	563.76	559.63	491.85
6	36.86	50.65	14.29	22.57	18.05	741.22	589.59	467.00	569.55	350.15
7	24.24	54.60	0.00	16.24	19.69	831.15	533.87	477.77	672.36	215.10

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1	1494.15	0.666	1.547	0.711	0.484	0.423
2	1461.23	0.684	1.530	0.814	0.421	0.443
3	1318.74	0.692	1.417	0.804	0.458	0.512
4	1174.72	0.669	1.285	0.787	0.496	0.560
5	1028.35	0.646	1.156	0.825	0.515	0.612
6	865.85	0.587	0.993	0.768	0.573	0.654
7	816.72	0.579	0.952	0.803	0.627	0.664

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1478.37	0.614	0.872	1.3360	0.244	0.043	0.7127	0.7346	0.9567	0.294
2	1446.63	0.646	0.941	1.3690	0.198	0.038	0.7680	0.7865	0.9463	0.315
3	1316.46	0.666	0.835	1.5080	0.122	0.024	0.8627	0.8741	0.9501	0.407
4	1184.69	0.659	0.722	1.6840	0.136	0.027	0.8553	0.8666	0.9419	0.486
5	1051.48	0.679	0.640	1.9060	0.083	0.016	0.9178	0.9241	0.9316	0.575
6	919.71	0.634	0.504	2.2170	0.138	0.025	0.8839	0.8922	0.9077	0.694
7	887.46	0.709	0.456	2.3398	0.166	0.032	0.8711	0.8803	0.9056	0.741

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.781	1.272	1.764	1.246
2	10.0000	1.831	1.242	1.810	1.241
3	30.0000	1.876	1.233	1.847	1.223
4	50.0000	1.820	1.219	1.784	1.211
5	70.0000	1.792	1.203	1.771	1.194
6	90.0000	1.671	1.186	1.589	1.153
7	95.0000	1.768	1.21[illegible]	1.689	1.186

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.7584	1.7884	1.8106
Adiabatic Efficiency =	0.8155	0.8420	0.8262
Polytropic Efficiency =	0.8295	0.8544	0.8401

Percent Design Speed = 110.0 Discharge Valve Setting= 8.0
Cor. Nozzle Weight Flow= 228.43 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9932 TE Check Flow/Noz.Flow = 1.0013
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 11 READING NUMBER 71 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG BODY SURF.	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		47.26	39.47	7.79		748.67		508.22	550.01	
2		39.11	39.11	0.00		783.60		608.04	494.24	
3		39.29	39.01	0.28		824.71		637.97	522.06	
4		41.38	39.80	1.58		811.47		607.79	535.53	
5		41.96	40.86	1.10		823.10		609.23	547.80	
6		48.11	42.22	5.89		743.11		492.58	549.14	
7		52.93	42.76	9.37		823.54		501.99	645.53	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		+2.78	-14.13	8.35	50.04	522.36		321.74	-25.30	
2		+1.11	-10.10	8.99	48.21	587.99		587.85	-11.35	
3		1.70	-8.87	10.57	47.59	629.76		629.22	18.67	
4		+0.73	-8.75	8.02	42.12	584.95		584.25	+7.49	
5		1.40	-9.10	10.50	46.96	573.20		571.80	13.95	
6		0.63	-10.98	11.21	47.48	499.47		497.90	5.47	
7		+4.83	-12.86	7.53	56.96	600.58		486.28	-41.13	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.617		1.027	0.555	0.349
2		0.656		0.967	0.458	0.328
3		0.697		0.986	0.423	0.321
4		0.689		0.961	0.470	0.392
5		0.705		0.939	0.474	0.426
6		0.635		1.011	0.503	0.499
7		0.702		0.969	0.601	0.401

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.426		1.5230	0.131	0.043		0.6987		0.328
2		0.484		1.5440	0.079	0.025		0.7572		0.306
3		0.524		1.6310	0.052	0.016		0.7840		0.296
4		0.487		1.7420	0.025	0.007		0.8269		0.365
5		0.481		1.8800	0.058	0.015		0.8376		0.397
6		0.418		2.0510	0.100	0.024		0.9152		0.479
7		0.409		2.0980	0.107	0.026		0.6367		0.373

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.961	0.981	0.978	1.000
2	10.0000	0.969	0.999	0.980	1.000
3	30.0000	0.971	0.992	0.985	1.000
4	50.0000	0.973	0.993	0.993	1.000
5	70.0000	0.972	0.992	0.984	1.000
6	90.0000	0.987	0.998	0.976	1.000
7	95.0000	0.929	0.979	0.968	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.7584	0.9832	0.9699
Polytropic Efficiency	=	0.8295	0.9708	------

Percent Design Speed =	110.0	Discharge Valve Setting=	8.0
Cor. Nozzle Weight Flow=	228.43	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0066	TE Check Flow/Noz.Flow =	0.9822
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 808 - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 70 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.83	0.	60.60	6.28	3.53	644.90	1628.27	639.95	0.	1495.12
2	68.10	0.	59.61	8.49	5.46	589.85	1576.67	587.78	0.	1462.18
3	65.38	0.	56.01	9.37	6.91	604.74	1451.56	604.72	0.	1319.59
4	62.27	0.	52.56	9.71	3.87	619.70	1328.83	617.91	0.	1175.48
5	56.97	0.	49.71	7.26	8.67	678.42	1232.53	669.02	0.	1029.01
6	55.47	0.	47.11	8.36	8.70	621.89	1066.03	596.12	0.	866.41
7	54.21	0.	46.13	8.08	8.18	619.79	1025.69	589.12	0.	817.25

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.98	51.04	54.80	6.18	5.85	775.30	1004.33	486.74	601.90	877.42
2	57.19	41.52	54.42	2.77	10.91	794.88	1097.54	594.08	525.95	921.61
3	51.55	43.90	50.68	0.87	13.83	822.98	953.69	592.94	570.51	746.80
4	49.95	46.26	43.79	6.16	12.32	767.42	824.59	530.56	554.34	631.12
5	42.06	47.12	32.15	9.91	14.91	782.44	737.38	531.56	572.45	479.71
6	39.59	52.79	14.29	25.30	15.88	713.90	562.20	429.20	565.32	354.98
7	23.20	55.49	8.00	15.20	31.01	838.50	522.99	471.62	685.88	202.16

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1495.12	0.598	1.509	0.761	0.521	0.425
2	1462.18	0.543	1.453	1.011	0.425	0.425
3	1319.59	0.558	1.339	0.981	0.473	0.498
4	1175.48	0.573	1.228	0.859	0.504	0.562
5	1029.01	0.631	1.147	0.795	0.541	0.642
6	866.41	0.574	0.985	0.720	0.595	0.701
7	817.25	0.573	0.948	0.801	0.639	0.718

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	HOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1479.32	0.633	0.820	1.3340	0.243	0.044	0.7328	0.7548	0.9485	0.299
2	1447.56	0.661	0.913	1.3698	0.209	0.041	0.7770	0.7961	0.9336	0.306
3	1317.31	0.689	0.799	1.5080	0.121	0.025	0.8768	0.8877	0.9573	0.402
4	1185.45	0.646	0.694	1.6840	0.127	0.024	0.8756	0.8859	0.9337	0.495
5	1052.16	0.664	0.609	1.9066	0.088	0.017	0.9163	0.9230	0.9100	0.609
6	920.30	0.608	0.479	2.2178	0.145	0.025	0.8825	0.8911	0.8868	0.748
7	888.03	0.712	0.444	2.3398	0.184	0.036	0.8621	0.8721	0.8741	0.803

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.865	1.302	1.852	1.263
2	10.0000	1.913	1.262	1.896	1.239
3	30.0000	1.972	1.252	1.937	1.238
4	50.0000	1.857	1.226	1.842	1.218
5	70.0000	1.820	1.213	1.801	1.200
6	90.0000	1.688	1.189	1.714	1.189
7	95.0000	1.830	1.224	1.713	1.193

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST
Total Pressure Ratio =	1.8148	1.8554	1.8721
Adiabatic Efficiency =	0.8168	0.8498	0.8218
Polytropic Efficiency =	0.8315	0.8623	0.8368

Percent Design Speed = 110.1 Discharge Valve Setting= 7.2
Cor. Nozzle Weight Flow= 228.61 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9222 TE Check Flow/Noz.Flow = 0.9874
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 70 DATE 8/ 8/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		50.88	39.47	11.41		778759		491.21	604.07	
2		40.90	39.11	1.79		606719		609.32	527.86	
3		41.84	39.81	2.03		634786		636.66	569.96	
4		43.76	39.80	3.96		794772		573.01	548.82	
5		44.38	40.86	3.52		804759		572.52	560.35	
6		50.34	42.22	8.12		712779		451.92	545.06	
7		53.84	42.76	10.28		829766		495.42	658.90	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-2.51	-11.13	8.62	53.39	553783		553.29	-24.21	
2		-0.98	-10.10	9.12	41.89	608776		608.64	-10.44	
3		2.25	-8.87	11.12	39.59	650769		649.93	25.49	
4		-0.03	-8.75	8.72	43.80	578796		578.31	-0.33	
5		2.37	-9.10	11.47	42.02	542776		541.13	22.39	
6		1.83	-10.58	12.41	48.50	456771		455.07	14.58	
7		-6.58	-12.36	5.78	59.63	496762		491.97	-52.17	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.636		1.126	0.554	0.344
2		0.671		0.999	0.461	0.324
3		0.719		1.021	0.433	0.304
4		0.671		1.009	0.469	0.390
5		0.684		0.965	0.501	0.430
6		0.607		1.007	0.537	0.541
7		0.704		0.918	0.651	0.395

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.450		1.5230	0.122	0.040		0.7253		0.322
2		0.498		1.5440	0.087	0.028		0.7619		0.301
3		0.539		1.6310	0.068	0.021		0.7402		0.278
4		0.481		1.7428	0.057	0.016		0.8415		0.364
5		0.453		1.8800	0.088	0.023		0.8025		0.403
6		0.380		2.0516	0.126	0.031		0.9194		0.518
7		0.380		2.0980	0.101	0.024		0.5822		0.367

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.964	0.970	0.971	1.000
2	10.0000	0.969	0.997	0.977	1.000
3	30.0000	0.962	0.988	0.986	1.000
4	50.0000	0.977	0.993	0.985	1.000
5	70.0000	0.966	0.990	0.976	1.000
6	90.0000	0.988	1.000	0.973	1.000
7	95.0000	0.988	0.975	0.978	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.8148	0.9781	0.9673
Polytropic Efficiency =	0.8315	0.9642	------

Percent Design Speed = 110.1 Discharge Valve Setting= 7.2
Cor. Nozzle Weight Flow= 228.61 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9926 TE Check Flow/Noz.Flow = 0.9992
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

630370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 69 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SOLDY S.RF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.11	0.	60.40	4.51	1.31	700.74	1653.43	695.04	0.	1497.75
2	63.90	0.	59.61	4.29	1.26	720.12	1632.19	717.60	0.	1464.75
3	61.52	0.	56.01	5.51	1.05	717.15	1503.91	717.14	0.	1321.91
4	59.86	0.	52.56	7.30	1.46	685.80	1362.70	683.83	0.	1177.55
5	57.69	0.	49.71	7.98	1.19	661.14	1224.62	651.98	0.	1030.82
6	56.33	0.	47.11	9.02	1.36	607.78	1059.14	582.61	0.	867.93
7	54.93	0.	46.13	8.80	0.90	604.47	1017.78	574.75	0.	818.68

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.61	51.11	54.80	3.81	6.69	821.72	989.40	514.74	638.22	843.71
2	56.09	43.29	54.42	1.67	7.81	821.34	1070.94	596.85	562.20	887.91
3	51.09	45.53	50.68	0.41	10.43	834.58	930.78	584.56	595.46	724.16
4	49.89	48.30	43.79	6.10	9.97	773.07	798.27	514.26	577.10	610.44
5	43.06	48.81	32.15	10.91	14.62	771.41	695.77	507.38	579.80	474.21
6	41.49	53.37	14.29	27.20	14.64	697.03	556.90	413.52	556.26	365.66
7	21.26	56.63	8.00	13.26	33.67	853.77	510.35	466.39	708.10	181.49

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1497.75	0.653	1.542	0.741	0.545	0.456
2	1464.75	0.673	1.526	0.832	0.469	0.478
3	1321.91	0.670	1.406	0.815	0.512	0.549
4	1177.55	0.639	1.269	0.752	0.540	0.603
5	1030.82	0.614	1.137	0.778	0.557	0.665
6	867.93	0.560	0.978	0.718	0.596	0.727
7	818.68	0.558	0.939	0.811	0.654	0.736

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1481.92	0.669	0.806	1.3348	0.237	0.046	0.7476	0.7699	0.9565	0.325
2	1450.11	0.682	0.889	1.3690	0.205	0.042	0.7823	0.8019	0.9640	0.348
3	1319.63	0.697	0.777	1.5080	0.125	0.026	0.8716	0.8833	0.9608	0.445
4	1187.54	0.648	0.669	1.6840	0.131	0.025	0.8714	0.8823	0.9312	0.534
5	1054.01	0.653	0.589	1.9068	0.103	0.020	0.9051	0.9128	0.9084	0.636
6	921.92	0.591	0.472	2.2178	0.198	0.033	0.8443	0.8556	0.8571	0.780
7	889.59	0.724	0.433	2.3390	0.245	0.049	0.8227	0.8356	0.8744	0.827

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.969	1.318	1.943	1.280
2	10.0000	1.995	1.372	1.978	1.274
3	30.0000	2.029	1.263	1.982	1.248
4	50.0000	1.900	1.237	1.877	1.227
5	70.0000	1.845	1.216	1.822	1.207
6	90.0000	1.698	1.192	1.708	1.196
7	95.0000	1.875	1.232	1.707	1.201

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.8502	1.9015	1.9253
Adiabatic Efficiency =	0.8030	0.8421	0.8282
Polytropic Efficiency =	0.8193	0.8557	0.8433

Percent Design Speed = 110.30 Discharge Valve Setting= 6.7
Cor. Nozzle Weight Flow= 225.55 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9863 TE Check Flow/Noz.Flow = 1.0013
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Concluded)

STATOR BLADE ROW • NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS POINT NUMBER 9 READING NUMBER 69 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		50.95	39.47	11.48		824.73		519.52	640.52	
2		42.67	39.11	3.56		832.57		612.18	564.24	
3		43.49	39.01	4.48		864.73		627.13	594.89	
4		45.95	39.80	6.05		797.47		554.61	571.36	
5		46.14	40.86	5.28		790.28		545.37	567.54	
6		50.95	42.22	8.73		695.13		435.09	536.32	
7		54.22	42.76	11.46		843.35		489.89	679.84	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.46	-11.13	10.67	51.42	610.26		610.23	-4.91	
2		-0.41	-10.10	9.69	43.08	648.02		647.96	-4.64	
3		1.74	-8.87	10.61	41.75	649.24		648.67	19.68	
4		0.26	-8.75	9.01	45.59	565.22		564.59	2.56	
5		1.27	-9.10	10.37	44.87	525.21		523.96	11.59	
6		1.18	-10.58	11.76	49.77	420.07		418.69	8.60	
7		-5.83	-12.36	7.33	59.26	420.99		418.03	-36.83	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.672		1.175	0.517	0.287
2		0.692		1.058	0.443	0.283
3		0.725		1.034	0.452	0.281
4		0.671		1.018	0.495	0.368
5		0.670		0.961	0.521	0.418
6		0.590		0.962	0.577	0.562
7		0.715		0.853	0.700	0.390

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.495		1.5230	0.121	0.040		0.6647		0.265
2		0.529		1.5446	0.085	0.028		0.7214		0.260
3		0.535		1.6316	0.095	0.029		0.6619		0.257
4		0.467		1.7426	0.098	0.028		0.7589		0.343
5		0.436		1.8800	0.107	0.029		0.7599		0.392
6		0.348		2.0518	0.109	0.027		0.8874		0.542
7		0.348		2.0980	0.081	0.019		0.5335		0.361

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.955	0.971	0.968	1.000
2	10.0000	0.964	1.001	0.976	1.000
3	30.0000	0.949	0.988	0.974	1.000
4	50.0000	0.963	0.992	0.974	1.000
5	70.0000	0.960	0.992	0.972	1.000
6	90.0000	0.983	1.003	0.977	1.000
7	95.0000	0.887	0.975	0.974	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.8502	0.9730	0.9571
Polytropic Efficiency	=	0.8193	0.9574	------

Percent Design Speed = 110.30 Discharge Valve Setting= 6.7
Cor. Nozzle Weight Flow= 225.55 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 1.0066 TE Check Flow/Noz.Flow = 1.0214
Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350

APPENDIX E

TABULATIONS OF BLADE ELEMENT DATA FOR RADIAL INLET DISTORTION TESTING

The rotor and stator blade element data from tests with inlet tip radial distortion are presented in this appendix. The data were obtained at open throttle, near stall and at intermediate flow conditions at 100% design speed.

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Blade Element Data For Radial Inlet Distortion Testing

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 81 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUC SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.74	-1.34	60.60	4.14	1.44	653.10	1520.70	647.92	-15.13	1373.40
2	64.27	-1.87	59.61	4.66	-1.63	652.88	1499.01	650.25	-21.19	1349.53
3	57.94	-8.05	56.01	1.93	-2.53	751.20	1415.32	751.18	-0.71	1199.51
4	49.31	0.56	52.56	-3.25	-0.09	913.09	1398.22	910.41	8.94	1058.95
5	43.03	-8.15	49.71	-6.68	-13.47	1018.44	1384.18	1004.32	-2.59	937.42
6	45.12	-7.21	47.11	-1.99	-9.45	834.31	1158.53	800.61	-16.89	801.99
7	45.96	-6.51	46.13	-0.17	-6.07	775.32	1086.84	736.73	-19.45	761.69

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.30	31.62	54.80	2.50	7.44	728.21	1145.88	618.29	380.74	963.18
2	57.05	30.74	54.42	2.63	7.22	717.44	1132.21	615.17	365.85	949.22
3	51.50	29.78	50.68	0.82	6.44	753.82	1050.93	654.08	374.34	822.39
4	51.56	26.07	43.79	7.77	32.25	685.56	990.42	615.66	301.26	775.69
5	44.07	30.56	32.15	11.92	-1.04	714.15	855.21	613.42	362.13	593.73
6	26.86	34.88	14.29	12.57	18.26	855.76	788.38	694.61	484.28	351.78
7	22.04	39.60	8.00	14.04	23.92	861.27	720.23	654.78	541.62	265.13

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CHI
1	1358.27	0.604	1.406	0.954	0.112	0.023	0.8342	0.8442	0.343	0.345
2	1328.34	0.604	1.387	0.946	0.056	0.011	0.9125	0.9178	0.339	0.359
3	1198.81	0.707	1.333	0.871	0.074	0.015	0.8936	0.9002	0.345	0.429
4	1067.89	0.873	1.337	0.676	0.043	0.008	0.9093	0.9181	0.354	0.464
5	934.83	0.997	1.355	0.611	0.120	0.023	0.7620	0.7711	0.452	0.528
6	787.11	0.792	1.099	0.868	0.135	0.027	0.8236	0.8322	0.419	0.418
7	742.44	0.730	1.023	0.889	0.225	0.045	0.7478	0.7599	0.452	0.367

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT PRESS LOSS PARAM	F INST ADB EFFICIENCY	F INST POLY EFFICIENCY	MOMEN MEAS T RISE	RISE/ RISE	STAT PRESS COEFF
1	1343.92	0.626	0.986	1.3340	0.124	0.025	0.8115	0.8223	1.0044		0.241
2	1315.07	0.621	0.980	1.3690	0.046	0.009	0.9280	0.9324	1.0380		0.253
3	1196.74	0.657	0.916	1.5080	0.020	0.004	0.9694	0.9713	0.9423		0.336
4	1076.95	0.804	0.872	1.6840	0.186	0.034	0.6523	0.6647	1.0570		0.381
5	955.85	0.630	0.755	1.9060	0.141	0.030	0.6772	0.6882	1.0307		0.453
6	836.07	0.761	0.701	2.2170	0.196	0.039	0.7354	0.7448	1.0064		0.411
7	806.75	0.763	0.638	2.3390	0.243	0.048	0.6993	0.7115	1.0038		0.393

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.561	1.163	1.521	1.157
2	10.0000	1.558	1.148	1.561	1.147
3	30.0000	1.568	1.154	1.567	1.142
4	50.0000	1.346	1.098	1.291	1.116
5	70.0000	1.317	1.108	1.278	1.108
6	90.0000	1.423	1.129	1.364	1.127
7	95.0000	1.415	1.140	1.341	1.125

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.3359	1.3803	1.4502
Adiabatic Efficiency =	0.6650	0.7436	0.8600
Polytropic Efficiency =	0.6784	0.7550	0.8672

Percent Design Speed = 100.0 Discharge Valve Setting= 50.0
Cor. Nozzle Weight Flow= 216.41 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9778 TE Check Flow/Noz.Flow = 0.9247
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Radial Inlet Distortion Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 61 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		31.46	39.47	-8.01		732.21		624.59	382.12	
2		30.16	39.11	-8.95		730.75		631.77	367.18	
3		27.80	39.01	-11.21		802.24		709.92	373.98	
4		23.90	39.80	-15.90		738.24		673.92	298.26	
5		27.94	40.86	-12.92		761.43		668.98	354.47	
6		31.92	42.22	-10.30		893.59		749.41	486.92	
7		36.74	42.76	-6.02		879.77		696.61	520.00	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV AND TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1.32	-11.13	12.45	30.14	676.44		676.25	15.53	
2		1.53	-10.10	11.63	28.64	737.65		737.34	19.67	
3		0.94	-8.87	9.81	26.86	746.60		746.19	12.28	
4		-1.71	-8.75	7.04	25.60	718.99		717.87	-21.41	
5		-2.31	-9.10	6.79	31.25	727.16		724.40	-41.90	
6		0.55	-10.58	11.13	31.36	849.22		846.56	8.20	
7		0.29	-12.36	12.65	36.45	822.98		820.32	4.18	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.630		1.093	0.240	-0.077
2		0.633		1.167	0.144	-0.062
3		0.753		1.052	0.207	-0.024
4		0.654		1.046	0.150	+0.089
5		0.676		1.084	0.182	+0.120
6		0.799		1.129	0.172	+0.133
7		0.781		1.178	0.201	+0.118

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.562		1.5230	0.209	0.069		-0.5652		-0.069
2		0.642		1.5440	0.090	0.029		2.4431		+0.056
3		0.652		1.6310	0.078	0.024		+0.1890		+0.021
4		0.693		1.7420	0.085	0.024		+1.5676		+0.079
5		0.644		1.8800	0.138	0.037		+1.4147		+0.105
6		0.756		2.0510	0.149	0.036		+1.4538		+0.111
7		0.731		2.0930	0.159	0.038		+1.0690		+0.108

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.942	0.990	0.950	1.000
2	10.0000	0.990	0.994	0.979	1.000
3	30.0000	0.948	0.995	0.977	1.000
4	50.0000	0.957	1.006	0.978	1.000
5	70.0000	0.936	0.997	0.963	1.000
6	90.0000	0.904	0.996	0.946	1.000
7	95.0000	0.906	0.996	0.945	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.3359	0.9678	0.9465
Polytropic Efficiency	=	0.6784	0.8985	------

Percent Design Speed	= 100.0	Discharge Valve Setting=	50.0
Cor. Nozzle Weight Flow=	216.41	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9296	TE Check Flow/Noz.Flow =	0.9041
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

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Blade Element Data For Radial Inlet Distortion Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 83 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.90	=3.26	60.60	5.30	2.60	629.37	1528.75	623.55	-35.51	1393.64
2	64.53	=0.93	59.61	4.92	1.89	639.95	1483.61	637.43	-10.33	1338.53
3	58.89	=0.75	56.01	2.88	=1.58	729.35	1411.29	729.27	=9.57	1209.26
4	49.47	0.23	52.56	=3.09	=8.93	912.38	1401.76	909.75	3.59	1064.19
5	43.49	=0.33	49.71	=6.22	=13.01	1005.23	1376.50	991.28	=5.65	946.38
6	45.34	=1.18	47.11	=1.77	=9.43	827.45	1153.22	794.03	-16.42	837.44
7	45.73	=0.43	46.13	=0.40	=8.30	767.09	1071.30	729.12	=5.49	747.66

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.01	44.11	54.80	2.21	8.89	747.30	984.38	535.43	519.13	824.65
2	56.45	39.95	54.42	2.03	8.08	732.65	1015.34	560.58	469.56	845.36
3	51.79	36.43	50.68	1.11	7.09	740.65	963.30	595.74	439.78	756.83
4	51.06	33.17	43.79	7.27	=1.59	663.36	906.03	569.38	372.19	704.64
5	44.34	36.53	32.15	12.19	=0.84	693.93	=779.19	556.34	412.18	=543.58
6	30.23	39.54	14.29	15.94	15.11	777.01	695.11	593.60	490.11	345.87
7	23.33	44.48	8.00	15.33	22.40	809.28	633.53	570.78	560.51	246.16

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	YR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CHI
1	1358.13	0.580	1.408	0.859	0.142	0.033	0.8144	0.8290	0.491	0.446
2	1328.20	0.590	1.369	0.879	0.103	0.021	0.8785	0.8880	0.433	0.476
3	1193.68	0.695	1.325	0.817	0.054	0.011	0.9344	0.9394	0.423	0.537
4	1047.78	0.873	1.341	0.626	0.037	0.007	0.9385	0.9419	0.432	0.561
5	934.73	0.980	1.343	0.551	0.101	0.019	0.8314	0.8397	0.514	0.615
6	787.02	0.783	1.091	0.748	0.123	0.024	0.8480	0.8559	0.499	0.549
7	742.37	0.720	1.006	0.783	0.135	0.027	0.8592	0.8672	0.527	0.546

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT PRESS LOSS PARAM	F INST ADB EFFICIENCY	F INST POLY EFFICIENCY	MOMEN MEAS T RISE	RISE/ RISE	STAT PRESS COEFF
1	1343.78	0.626	0.824	1.3340	0.146	0.030	0.8231	0.8364	0.9918		0.331
2	1314.93	0.618	0.856	1.3690	0.088	0.018	0.8940	0.9022	0.9619		0.364
3	1196.61	0.635	0.826	1.5080	=0.012	=0.002	1.0147	1.0136	0.9150		0.442
4	1076.83	0.591	0.787	1.4640	0.152	0.028	0.7680	0.7798	1.0033		0.478
5	955.75	0.605	0.679	1.9060	0.118	0.022	0.8030	0.8123	0.9831		0.547
6	835.98	0.681	0.609	2.2170	0.142	0.028	0.8226	0.8316	0.9673		0.545
7	806.67	0.709	0.555	2.3390	0.143	0.032	0.8158	0.8250	0.9943		0.579

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.798	1.224	1.738	1.208
2	10.0000	1.783	1.205	1.777	1.200
3	30.0000	1.750	1.186	1.762	1.173
4	50.0000	1.483	1.127	1.448	1.146
5	70.0000	1.424	1.128	1.409	1.128
6	90.0000	1.462	1.176	1.445	1.135
7	95.0000	1.510	1.146	1.434	1.133

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5168	1.5377	1.5971
Adiabatic Efficiency =	0.7854	0.8130	0.8880
Polytropic Efficiency =	0.7977	0.8240	0.8952

Percent Design Speed = 100.0 Discharge Valve Setting= 14.0
Cor. Nozzle Weight Flow= 219.95 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9730 TE Check Flow/Noz.Flow = 0.9071
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Radial Inlet Distortion Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 9 READING NUMBER 83 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		47.95	39.47	4.48		750.75		540.52	521.01	
2		39.36	39.11	0.25		743.16		574.59	471.27	
3		34.44	39.01	-4.57		777.23		640.67	439.36	
4		30.90	39.80	-9.00		721.33		618.19	368.49	
5		33.86	40.86	-7.00		729.27		601.24	403.46	
6		36.80	42.22	-5.42		797.22		631.73	472.54	
7		41.76	42.76	-1.00		816.40		602.66	538.14	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1.83	-11.13	12.96	42.11	576.41		576.10	18.45	
2		0.36	-10.10	10.46	39.00	636.35		636.31	4.01	
3		-0.43	-8.87	8.44	34.88	616.73		616.45	-4.67	
4		-2.43	-8.75	6.32	33.23	592.21		591.82	-25.10	
5		-1.53	-9.10	7.27	35.70	585.53		583.98	-18.69	
6		-0.35	-10.58	10.23	37.15	635.63		633.66	-3.89	
7		-1.56	-12.36	10.80	43.32	600.82		598.17	-16.26	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.629		1.066	0.452	0.216
2		0.628		1.107	0.347	0.241
3		0.669		0.962	0.381	0.259
4		0.629		0.956	0.335	0.287
5		0.637		0.971	0.349	0.296
6		0.700		1.003	0.346	0.257
7		0.716		0.993	0.424	0.253

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.490		1.5230	0.144	0.047		0.9482		0.200
2		0.535		1.5440	0.051	0.017		0.9353		0.224
3		0.524		1.6310	0.053	0.016		0.7095		0.238
4		0.508		1.7420	0.025	0.007		0.8709		0.268
5		0.506		1.8800	0.027	0.007		0.8449		0.276
6		0.550		2.0510	0.065	0.016		0.7168		0.235
7		0.918		2.0980	0.093	0.022		0.5675		0.230

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.952	0.979	0.966	1.000
2	10.0000	0.995	0.989	0.988	1.000
3	30.0000	0.968	0.994	0.986	1.000
4	50.0000	0.938	1.006	0.994	1.000
5	70.0000	0.985	0.995	0.994	1.000
6	90.0000	0.966	0.995	0.982	1.000
7	95.0000	0.934	0.985	0.972	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =		1.5168	0.9864	0.9759
Polytropic Efficiency =		0.7977	0.9680	------
Percent Design Speed =	100.0	Discharge Valve Setting=		14.0
Cor. Nozzle Weight Flow=	215.95	Vane Schedule =		0.0
LE Check Flow/Noz.Flow =	0.9119	TE Check Flow/Noz.Flow =		0.8799
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =		0.935

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Blade Element Data For Radial Inlet Distortion Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 8 READING NUMBER 82 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.25	-4.23	60.60	6.65	3.95	593.67	1521.09	587.54	-43.45	1401.13
2	66.19	-2.96	59.61	6.58	3.55	602.50	1486.07	599.59	-31.05	1358.80
3	59.68	-2.62	56.01	3.67	-0.59	714.73	1422.99	713.96	-32.62	1230.90
4	49.59	-.62	52.56	-2.97	-8.81	903.16	1390.76	900.51	9.78	1057.64
5	45.35	-2.04	49.71	-4.36	-11.15	970.69	1370.98	956.85	-34.15	968.57
6	46.06	-1.82	47.11	-1.05	-8.71	815.16	1150.03	782.03	-24.85	811.60
7	46.97	-2.51	46.13	0.84	-7.06	760.64	1084.55	722.37	-31.63	773.75

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.86	52.07	54.80	3.06	9.39	761.34	879.27	467.24	599.65	743.68
2	55.62	45.76	54.42	1.20	10.57	758.30	936.48	528.24	542.38	772.11
3	51.74	39.88	50.68	1.06	8.14	741.12	918.43	568.61	475.11	721.10
4	49.59	37.61	43.79	5.80	-0.00	698.79	853.84	553.45	426.42	650.05
5	43.41	38.86	32.15	1.26	1.94	701.87	752.20	545.42	439.42	516.01
6	31.35	42.69	14.29	7.06	14.72	748.67	646.21	545.61	503.35	332.34
7	23.59	47.49	8.00	15.59	23.37	789.34	586.99	527.84	579.88	230.52

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CHI
1	1357.67	0.544	1.393	0.795	0.183	0.037	0.8084	0.8249	0.579	0.479
2	1327.76	0.553	1.363	0.881	0.135	0.028	0.8568	0.8691	0.510	0.499
3	1198.28	0.670	1.333	0.796	0.083	0.017	0.9064	0.9139	0.473	0.559
4	1067.42	0.861	1.326	0.615	0.041	0.008	0.9412	0.9448	0.475	0.612
5	934.42	0.941	1.329	0.570	0.075	0.014	0.8853	0.8917	0.543	0.629
6	786.76	0.770	1.087	0.698	0.125	0.024	0.8526	0.8608	0.544	0.601
7	742.12	0.714	1.017	0.731	0.123	0.024	0.8753	0.8828	0.583	0.596

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT PRESS LOSS PARAM	F INST ADB EFFICIENCY	F INST POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1	1343.33	0.636	0.728	1.3343	0.173	0.035	0.8092	0.8247	1.0231	0.363
2	1314.49	0.632	0.781	1.3693	0.125	0.026	0.8640	0.8754	0.9681	0.387
3	1196.21	0.629	0.780	1.5082	-0.002	-0.000	1.0020	1.0018	0.8903	0.464
4	1076.47	0.601	0.735	1.6844	0.148	0.028	0.7957	0.8074	0.9904	0.534
5	955.43	0.619	0.653	1.9063	0.089	0.017	0.8648	0.8723	0.9711	0.564
6	835.70	0.652	0.563	2.2174	0.134	0.026	0.8392	0.8478	0.9436	0.601
7	816.40	0.688	0.511	2.3393	0.147	0.029	0.8400	0.8486	0.9732	0.629

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.904	1.250	1.839	1.233
2	10.0000	1.896	1.234	1.868	1.227
3	30.0000	1.820	1.206	1.835	1.189
4	50.0000	1.573	1.147	1.522	1.161
5	70.0000	1.497	1.138	1.493	1.141
6	90.0000	1.493	1.143	1.474	1.140
7	95.0000	1.558	1.153	1.477	1.141

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5914	1.6129	1.6716
Adiabatic Efficiency =	0.8003	0.8251	0.8854
Polytropic Efficiency =	0.8130	0.8365	0.8934

Percent Design Speed = 100.0 Discharge Valve Setting= 10.5
Cor. Nozzle Weight Flow= 212.58 Vane Schedule = 0.0

LE Check Flow/Noz.Flow = 0.9778 TE Check Flow/Noz.Flow = 0.9776
Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Radial Inlet Distortion Testing (Concluded)

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SUR	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		51.92	39.47	12.45		764.53		471.51	601.82	
2		45.18	39.11	6.07		767.48		541.00	544.35	
3		37.90	39.01	-1.11		773.01		609.68	474.65	
4		35.15	39.80	-4.65		734.82		599.58	422.18	
5		36.16	40.86	-4.70		733.05		588.45	430.13	
6		41.01	42.22	-2.21		762.21		578.27	485.31	
7		44.85	42.76	2.09		791.41		555.84	552.89	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		2.58	-11.13	13.71	49.34	562.96		562.38	25.38	
2		1.60	-10.10	11.70	43.57	612.80		612.53	17.14	
3		0.45	-8.87	9.32	37.45	587.68		587.42	4.64	
4		-2.28	-8.75	6.47	37.43	563.09		562.02	-22.40	
5		-1.52	-9.10	7.58	37.67	562.22		560.82	-14.84	
6		-1.28	-10.58	10.30	40.28	540.51		538.84	-2.42	
7		-2.38	-12.36	9.98	47.23	522.32		520.19	-21.62	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.633		1.193	0.511	0.275
2		0.640		1.132	0.424	0.293
3		0.659		0.963	0.426	0.325
4		0.635		0.937	0.406	0.360
5		0.638		0.953	0.393	0.381
6		0.665		0.932	0.444	0.377
7		0.690		0.936	0.510	0.355

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.464		1.5230	0.128	0.042		0.6261		0.256
2		0.508		1.5440	0.073	0.024		0.8365		0.272
3		0.494		1.6310	0.046	0.014		0.7851		0.302
4		0.479		1.7420	0.017	0.005		0.8766		0.338
5		0.482		1.8800	0.032	0.008		0.9305		0.358
6		0.463		2.0510	0.070	0.017		0.7685		0.352
7		0.447		2.0980	0.092	0.022		0.6429		0.329

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.955	0.975	0.969	1.000
2	10.0000	0.984	0.983	0.982	1.000
3	30.0000	0.973	0.991	0.988	1.000
4	50.0000	0.986	0.999	0.996	1.000
5	70.0000	0.992	0.997	0.992	1.000
6	90.0000	0.966	0.993	0.982	1.000
7	95.0000	0.937	0.986	0.974	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio	=	1.5914	0.9866	0.9768
Polytropic Efficiency	=	0.8130	0.9719	------

Percent Design Speed	= 100.0	Discharge Valve Setting	= 10.5
Cor. Nozzle Weight Flow	= 212.58	Vane Schedule	= 0.0

LE Check Flow/Noz.Flow	= 0.9085	TE Check Flow/Noz.Flow	= 0.8896
Assumed LE Flow Coeff.	= 0.955	Assumed TE Flow Coeff.	= 0.935

APPENDIX F

TABULATIONS OF FLOW SURVEY DATA FOR CIRCUMFERENTIAL INLET DISTORTION TESTING

The circumferential distortion flow survey data at Planes 0.95, 1.51 and 2.2 are presented in this appendix for maximum weight flow, intermediate weight flow and near-stall weight flow conditions at 100% design speed. At each of the three planes and three operating conditions, the survey data were obtained at 10%, 50% and 90% immersions from tip.

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow

PLANE NO. = 0.95
IMMERSION = 10% RADIUS = 17.420 SLOPE = =1.92

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.66	10.67	518.69	0.12	652.25	652.25	0.605
57.98	13.64	10.46	518.69	0.07	674.44	674.44	0.627
87.98	13.61	10.71	518.69	2.62	641.76	641.09	0.595
117.98	13.64	10.59	518.69	6.09	659.39	655.67	0.612
147.98	11.78	9.79	518.69	8.88	567.11	560.31	0.521
177.98	11.74	9.35	518.69	2.91	625.26	624.45	0.578
207.98	11.68	9.33	518.69	=2.61	622.57	621.93	0.576
237.98	13.74	9.98	518.69	=7.62	737.19	730.69	0.691
267.98	13.63	10.36	518.69	=4.97	684.81	682.23	0.638
297.98	13.65	10.46	518.69	=3.44	675.02	673.80	0.628
327.98	13.62	10.58	518.69	=1.59	659.33	659.07	0.612
357.98	13.65	10.48	518.69	=0.77	672.70	672.64	0.626

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLO
27.98	1336.33	1.37	1334.96	63.96	1485.78	1.378	3.30
57.98	1336.33	0.82	1335.51	63.21	1496.14	1.391	3.37
87.98	1336.33	29.34	1306.99	63.87	1455.76	1.349	3.25
117.98	1336.33	69.96	1266.37	62.63	1426.05	1.324	3.30
147.98	1336.33	87.54	1248.79	65.83	1368.73	1.259	2.56
177.98	1336.33	31.74	1304.59	64.42	1446.33	1.338	2.76
207.98	1336.33	=28.35	1364.68	65.50	1499.72	1.387	2.74
237.98	1336.33	=97.75	1434.08	63.00	1609.50	1.509	3.53
267.98	1336.33	=59.33	1395.66	63.95	1553.48	1.447	3.38
297.98	1336.33	=40.50	1376.83	63.92	1532.87	1.426	3.36
327.98	1336.33	=18.29	1354.62	64.06	1506.45	1.399	3.31
357.98	1336.33	-9.04	1345.37	63.44	1504.15	1.399	3.36

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. = 0.95
IMMERSION = 50% RADIUS = 13.797 SLOPE = 4.85

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.76	10.06	518.69	-0.01	727.65	727.65	0.681
57.98	13.76	10.07	518.69	1.27	726.81	726.63	0.680
87.98	13.73	10.09	518.69	4.23	722.21	720.24	0.676
117.98	13.73	10.11	518.69	9.53	720.20	710.26	0.674
147.98	11.66	9.38	518.69	16.15	610.70	586.60	0.564
177.98	11.66	8.86	518.69	4.04	683.51	681.81	0.637
207.98	11.64	8.81	518.69	-4.66	688.68	686.40	0.642
237.98	13.76	9.50	518.69	-9.82	788.05	776.50	0.744
267.98	13.74	9.77	518.69	-5.93	758.67	754.61	0.713
297.98	13.74	9.83	518.69	-3.48	751.65	750.26	0.706
327.98	13.76	9.96	518.69	-2.55	738.72	737.99	0.693
357.98	13.74	9.98	518.69	-0.94	735.21	735.11	0.689

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1058.40	-0.13	1058.53	55.49	1284.51	1.203	3.79
57.98	1058.40	16.11	1042.29	55.12	1270.58	1.190	3.79
87.98	1056.40	53.27	1003.13	54.38	1236.54	1.157	3.76
117.98	1056.40	119.24	939.16	52.90	1177.50	1.102	3.72
147.98	1058.40	169.87	888.53	56.57	1064.70	0.983	2.75
177.98	1058.40	48.16	1010.25	55.98	1218.79	1.135	3.10
207.98	1058.40	-55.95	1114.35	58.37	1308.79	1.220	3.10
237.98	1058.40	-134.40	1192.80	56.94	1423.28	1.344	3.89
267.98	1058.40	-78.38	1136.78	56.42	1364.44	1.283	3.85
297.98	1058.40	-45.63	1104.03	55.80	1334.83	1.254	3.85
327.98	1058.40	-32.87	1091.27	55.93	1317.38	1.235	3.82
357.98	1058.40	-12.06	1070.46	55.52	1298.57	1.217	3.81

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. = 0.95
IMMERSION = 90% RADIUS = 9.910 SLOPE = 15.60

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.77	10.09	518.69	-1.73	701.37	701.05	0.657
57.98	13.79	10.23	518.69	2.54	688.46	687.78	0.643
87.98	13.73	10.22	518.69	5.82	686.02	682.49	0.641
117.98	13.75	10.32	518.69	3.40	676.01	657.61	0.631
147.98	13.35	9.73	518.69	28.18	712.17	627.75	0.667
177.98	11.76	8.88	518.69	7.28	668.24	662.85	0.623
207.98	11.81	8.77	518.69	-11.10	687.88	675.01	0.643
237.98	13.70	9.57	518.69	-14.06	751.82	729.30	0.709
267.98	13.72	9.79	518.69	-9.07	729.52	720.39	0.685
297.98	13.71	9.90	518.69	-5.20	717.17	714.21	0.673
327.98	13.76	9.99	518.69	-5.04	711.10	708.35	0.667
357.98	13.76	10.05	518.69	-2.92	704.49	703.57	0.660

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	760.22	-21.17	781.39	48.10	1049.79	0.983	2.40
57.98	760.22	30.51	729.71	46.69	1002.75	0.937	2.38
87.98	760.22	69.56	690.66	45.34	970.97	0.907	2.36
117.98	760.22	156.66	603.56	42.55	892.60	0.833	2.28
147.98	760.22	336.32	[illegible].90	34.03	757.48	0.710	2.07
177.98	760.22	84.68	675.54	45.54	946.43	0.882	1.98
207.98	760.22	-132.43	892.65	52.90	1119.13	1.046	2.00
237.98	760.22	-182.65	942.87	52.28	1192.00	1.123	2.40
267.98	760.22	-115.00	875.22	50.54	1133.57	1.065	2.41
297.98	760.22	-65.00	825.22	49.12	1091.37	1.024	2.41
327.98	760.22	-62.47	822.69	49.27	1085.63	1.018	2.40
357.98	760.22	-35.89	796.11	48.53	1062.45	0.995	2.40

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, = 1.51
IMMERSION = 10% RADIUS = 17.081 SLOPE = -0.83

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	18.67	13.73	578.68	21.39	765.05	712.35	0.678
45.00	18.66	13.65	579.14	21.95	771.28	715.37	0.683
75.00	18.39	13.47	579.05	22.17	766.83	710.13	0.682
105.00	17.96	13.27	573.50	22.64	756.11	697.85	0.672
135.00	16.66	12.92	558.69	30.72	686.05	589.79	0.614
165.00	17.67	13.18	594.87	32.81	758.59	637.54	0.661
195.00	17.91	13.30	600.90	30.83	767.82	659.32	0.667
225.00	20.47	14.86	619.91	22.34	807.45	746.85	0.692
255.00	19.15	14.46	594.96	19.80	736.49	692.95	0.646
285.00	18.91	14.05	593.29	19.85	755.27	710.40	0.665
315.00	18.90	13.93	582.05	20.20	764.32	717.31	0.675
345.00	18.79	13.84	581.33	21.48	762.08	709.15	0.673

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1310.32	279.02	1031.30	55.37	1253.40	1.110	3.47
45.00	1310.32	288.30	1022.02	55.01	1247.51	1.105	3.47
75.00	1310.32	289.37	1020.96	55.18	1243.54	1.106	3.42
105.00	1310.32	291.06	1019.27	55.60	1235.27	1.098	3.31
135.00	1310.32	350.47	959.86	58.43	1126.58	1.008	2.76
165.00	1310.32	411.03	899.30	54.67	1102.36	0.961	2.89
195.00	1310.32	393.50	916.82	54.28	1129.28	0.980	2.99
225.00	1310.32	306.91	1003.41	53.34	1250.85	1.073	3.69
255.00	1310.32	249.48	1060.85	56.85	1267.11	1.112	3.49
285.00	1310.32	256.46	1053.86	56.02	1270.94	1.120	3.51
315.00	1310.32	263.92	1046.40	55.57	1268.66	1.120	3.53
345.00	1310.32	279.06	1031.27	55.49	1251.56	1.106	3.47

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, = 1.51
IMMERSION = 50% RADIUS = 14.056 SLOPE = 3.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	19.59	13.87	592.82	30.89	817.36	701.42	0.719
45.00	19.38	13.56	590.63	31.39	829.19	707.83	0.732
75.00	18.95	13.40	586.43	32.26	814.89	689.10	0.721
105.00	18.31	12.99	583.94	33.24	809.07	676.69	0.717
135.00	17.07	12.49	570.21	40.80	764.12	578.44	0.682
165.00	17.43	12.50	591.57	39.68	802.07	617.29	0.705
195.00	18.16	12.75	596.93	34.11	829.67	686.94	0.728
225.00	20.29	14.40	620.36	31.39	833.11	711.18	0.716
255.00	20.04	14.43	601.50	30.15	804.16	695.36	0.701
285.00	19.86	14.07	598.74	29.89	820.13	711.04	0.718
315.00	19.97	14.06	596.45	29.95	826.48	716.11	0.726
345.00	19.82	13.84	594.70	30.36	833.95	719.59	0.734

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1078.27	419.62	658.65	43.20	962.19	0.847	3.78
45.00	1078.27	431.89	646.38	42.40	958.56	0.846	3.76
75.00	1078.27	434.96	643.31	43.03	942.71	0.834	3.63
105.00	1078.27	443.49	634.78	43.17	927.82	0.822	3.46
135.00	1078.27	499.29	579.98	45.03	818.41	0.731	2.89
165.00	1078.27	512.12	566.15	42.53	837.60	0.736	2.99
195.00	1078.27	465.27	613.00	41.74	920.68	0.808	3.39
225.00	1078.27	433.93	644.34	42.18	959.66	0.825	3.80
255.00	1078.27	403.90	674.37	44.12	968.66	0.844	3.82
285.00	1078.27	408.70	669.57	43.28	976.68	0.859	3.85
315.00	1078.27	412.62	665.65	42.91	977.71	0.858	3.89
345.00	1078.27	421.50	656.77	42.39	974.24	0.858	3.87

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, = 1.5
IMMERSION = 90% RADIUS = 11.030 SLOPE = 11.17

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.17	14.18	595.37	35.77	869.44	705.44	0.770
45.00	21.11	14.09	594.67	36.04	872.34	705.38	0.773
75.00	20.69	13.80	598.66	36.86	867.03	693.71	0.772
105.00	20.01	13.38	585.17	37.07	863.32	688.84	0.771
135.00	18.46	12.31	570.93	40.97	856.65	646.82	0.775
165.00	17.98	12.01	580.51	43.24	862.63	628.42	0.773
195.00	18.08	12.29	593.51	39.72	853.87	656.78	0.755
225.00	20.97	14.29	611.91	28.36	860.95	757.53	0.750
255.00	21.33	14.48	605.76	37.29	863.18	686.72	0.756
285.00	20.52	14.01	599.99	36.91	852.36	681.53	0.749
315.00	20.75	14.00	597.02	36.32	862.40	694.86	0.761
345.00	21.14	14.19	596.20	35.76	867.29	703.78	0.767

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	846.14	508.22	337.92	25.60	782.20	0.692	2.34
45.00	846.14	513.24	332.90	25.26	779.99	0.691	2.33
75.00	846.14	520.10	326.04	25.17	766.31	0.683	2.27
105.00	846.14	520.40	325.74	25.31	761.98	0.680	2.20
135.00	846.14	561.67	284.46	23.74	706.60	0.639	1.95
165.00	846.14	590.95	255.19	22.10	678.26	0.608	1.81
195.00	846.14	545.66	300.48	24.58	722.25	0.639	1.89
225.00	846.14	408.91	437.22	29.99	874.65	0.762	2.45
255.00	846.14	522.95	323.18	25.20	758.97	0.665	2.28
285.00	846.14	511.89	334.24	26.12	759.08	0.667	2.21
315.00	846.14	510.80	335.34	25.76	771.54	0.681	2.27
345.00	846.14	506.84	339.30	25.74	781.30	0.691	2.33

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, = 2,20 RADIUS = 17,130 SLOPE = 0,24
IMMERSION = 10%

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6,83	18,10	13,17	579,95	-0,14	778,31	778,31	0,690
36,83	18,03	13,43	577,51	0,18	748,76	748,76	0,663
66,83	17,96	13,66	575,69	0,20	721,74	721,74	0,638
96,83	17,78	13,90	572,74	0,57	683,87	683,84	0,604
126,83	17,27	14,36	566,25	1,13	590,79	590,67	0,520
156,83	17,04	14,44	586,32	1,01	570,10	570,01	0,492
186,83	17,91	14,33	602,35	2,06	668,72	668,29	0,574
216,83	18,18	14,03	605,93	2,32	720,81	720,22	0,620
246,83	18,96	13,62	591,51	0,38	800,92	800,90	0,704
276,83	18,17	13,37	584,77	0,06	767,90	767,90	0,677
306,83	18,17	13,20	582,23	0,42	781,43	781,41	0,691
336,83	18,13	13,08	580,88	-0,10	788,55	788,54	0,699

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6,83	1314,08	-1,84	1315,93	59,40	1528,87	1,355	3,36
36,83	1314,08	2,39	1311,70	60,28	1510,36	1,337	3,29
66,83	1314,08	2,54	1311,54	61,18	1497,01	1,323	3,22
96,83	1314,08	6,81	1307,27	62,39	1475,32	1,302	3,09
126,83	1314,08	11,64	1302,44	65,61	1430,12	1,258	2,74
156,83	1314,08	10,05	1304,03	66,39	1423,17	1,227	2,56
186,83	1314,08	24,00	1290,08	62,61	1452,90	1,246	2,94
216,83	1314,08	29,20	1284,88	60,73	1472,97	1,266	3,12
246,83	1314,08	5,29	1308,80	58,54	1534,40	1,349	3,52
276,83	1314,08	0,85	1313,24	59,68	1521,27	1,340	3,33
306,83	1314,08	5,76	1308,32	59,15	1523,91	1,348	3,37
336,83	1314,08	-1,40	1315,48	59,06	1533,72	1,360	3,39

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, = 2.20
IMMERSION = 50%
RADIUS = [illegible] 420
SLOPE = 1.13

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
29.00	16.79	12.86	587.93	=0.39	851.68	851.66	0.756
59.00	18.61	13.03	594.98	=0.85	825.09	825.00	0.732.
89.00	18.21	13.10	591.66	=0.77	792.79	792.72	0.703
119.00	17.90	13.53	579.39	=0.86	731.10	731.01	0.645
149.00	16.85	13.93	569.00	=0.38	601.09	601.09	0.528
179.00	17.77	13.67	592.70	1.09	717.31	717.18	0.624
209.00	16.13	13.44	597.79	1.70	767.06	766.72	0.668
239.00	19.56	13.25	614.33	1.17	881.91	881.73	0.767
269.00	19.14	13.05	598.46	=0.51	863.41	863.38	0.760
299.00	16.84	12.84	593.59	0.20	860.34	860.34	0.761
329.00	18.83	12.73	591.56	=0.27	867.83	867.82	0.770
359.00	16.77	12.73	587.31	=0.43	860.95	860.93	0.766

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
29.00	1106.19	-5.77	1111.96	52.55	1400.63	1.244	3.93
59.00	1106.19	-12.26	1118.45	53.59	1389.81	1.233	3.85
89.00	1106.19	-10.61	1116.80	54.63	1369.55	1.214	3.71
119.00	1106.19	-10.94	1117.13	56.80	1335.15	1.178	3.51
149.00	1106.19	-4.04	1110.23	61.57	1262.50	1.109	2.94
179.00	1106.19	13.64	1092.55	56.72	1306.91	1.137	3.37
209.00	1106.19	22.74	1083.45	54.71	1327.30	1.155	3.55
239.00	1106.19	17.97	1088.22	50.98	1400.59	1.218	4.02
269.00	1106.19	-7.66	1113.85	52.22	1409.29	1.241	3.97
299.00	1106.19	2.96	1103.23	52.05	1399.03	1.237	3.93
329.00	1106.19	-4.10	1110.30	51.99	1409.21	1.250	3.95
359.00	1106.19	-6.41	1112.60	52.27	1406.80	1.251	3.95

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Maximum Weight Flow (Concluded)

PLANE NO, = 2.20
IMMERSION = 90% RADIUS = 11.779 SLOPE = 1.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18.56	18.87	12.62	593.12	-4.51	879.86	877.13	0.780
48.56	19.20	12.95	591.67	-3.55	869.60	867.93	0.771
78.56	19.64	13.17	596.74	-2.00	872.20	871.67	0.777
108.56	19.49	13.26	594.15	-0.79	855.44	855.34	0.763
138.56	18.57	13.68	574.45	-0.10	759.17	759.17	0.675
168.56	16.16	13.91	551.89	5.60	531.75	529.21	0.467
198.56	17.01	13.25	589.44	2.18	698.84	698.33	0.608
228.56	17.98	12.60	607.54	-0.58	839.80	839.75	0.731
258.56	19.37	13.27	612.31	-4.07	867.70	865.51	0.755
288.56	18.91	12.35	597.79	-4.75	907.85	904.73	0.805
318.56	19.00	12.33	597.06	-5.17	913.42	909.70	0.811
348.56	18.88	12.40	594.36	-4.94	899.50	896.15	0.799

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18.56	903.29	-69.18	972.47	47.95	1309.60	1.162	2.34
48.56	903.29	-53.87	957.16	47.80	1292.08	1.146	2.38
78.56	903.29	-30.38	933.67	46.97	1277.32	1.139	2.45
108.56	903.29	-11.81	915.10	46.93	1252.62	1.117	2.42
138.56	903.29	-1.39	904.68	50.00	1181.00	1.050	2.21
168.56	903.29	51.89	851.39	56.14	1002.47	0.981	1.53
198.56	903.29	26.61	876.68	51.46	1120.82	0.976	1.89
228.56	903.29	-8.46	911.74	47.35	1239.54	1.079	2.16
258.56	903.29	-61.58	964.87	48.11	1296.18	1.128	2.34
288.56	903.29	-75.17	978.46	47.24	1332.64	1.181	2.36
318.56	903.29	-82.32	985.60	47.29	1341.26	1.191	2.38
348.56	903.29	-77.49	980.78	47.58	1328.54	1.180	2.36

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow

PLANE NO. = 0.95
IMMERSION = 10% RADIUS = 17.420 SLOPE = -1.92

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.76	10.75	518.69	-0.09	650.52	650.52	0.603
57.98	13.72	10.64	518.69	-0.02	660.22	660.22	0.613
87.98	13.69	10.78	518.69	2.03	641.04	640.64	0.594
117.98	13.72	10.59	518.69	4.97	666.37	663.86	0.619
147.98	11.94	9.90	518.69	6.36	570.13	566.62	0.524
177.98	11.92	9.65	518.69	-0.54	603.48	603.45	0.557
207.98	11.78	10.00	518.69	-6.26	534.37	531.18	0.490
237.98	13.78	10.49	518.69	-5.71	694.16	690.76	0.637
267.98	13.70	10.75	518.69	-2.62	645.76	645.09	0.599
297.98	13.75	10.61	518.69	-1.62	666.73	666.46	0.620
327.98	13.74	10.76	518.69	-0.03	648.29	648.29	0.601
357.98	13.71	10.98	518.69	0.22	667.03	667.02	0.620

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1336.33	-1.02	1337.35	64.06	1487.17	1.379	3.32
57.98	1336.33	-0.23	1336.56	63.71	1490.73	1.384	3.34
87.98	1336.33	22.71	1313.62	64.00	1461.51	1.354	3.27
117.98	1336.33	57.73	1278.[illegible]	62.56	1440.67	1.339	3.35
147.98	1336.33	63.16	1273.17	66.01	1393.57	1.282	2.62
177.98	1336.33	-5.69	134[illegible].02	65.79	1471.45	1.358	2.74
207.98	1336.33	-58.27	1394.60	69.15	1492.33	1.368	2.46
237.98	1336.33	-68.07	1404.40	64.14	1560.70	1.453	3.41
267.98	1336.33	-29.52	1365.85	64.72	1510.52	1.400	3.29
297.98	1336.33	-18.85	1355.18	63.81	1510.19	1.403	3.37
327.98	1336.33	-0.34	1336.67	64.13	1485.58	1.378	3.31
357.98	1336.33	2.56	1333.77	63.43	1491.26	1.386	3.36

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 0.95
IMMERSION = 50%
RADIUS = 13,797
SLOPE = 4,85

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27,98	13,83	10,12	518,69	0,14	726,29	726,29	0,680
57,98	13,84	10,14	518,69	-1,74	725,85	725,52	0,680
87,98	13,81	10,16	518,69	-3,63	721,67	720,22	0,675
117,98	13,82	10,18	518,69	-7,39	719,62	713,64	0,673
147,98	11,84	9,47	518,69	-11,04	618,07	606,64	0,571
177,98	11,85	9,66	518,69	-14,17	592,66	591,09	0,546
207,98	11,85	9,68	518,69	-19,46	589,81	581,79	0,544
237,98	13,80	10,36	518,69	-10,05	697,52	686,81	0,651
267,98	13,81	10,16	518,69	-14,98	720,98	718,26	0,675
297,98	13,82	10,05	518,69	-12,23	733,92	733,36	0,688
327,98	13,84	10,11	518,69	-10,66	728,98	728,93	0,683
357,98	13,83	10,08	518,69	-10,33	731,74	731,73	0,686

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27,98	1058,40	1,77	1056,63	55,50	1282,17	1,206	3,81
57,98	1058,40	22,04	1036,36	55,01	1265,08	1,184	3,81
87,98	1058,40	45,69	1012,71	54,58	1242,70	1,163	3,79
117,98	1058,40	92,56	965,84	53,54	1200,89	1,123	3,76
147,98	1058,40	118,36	940,04	57,10	1118,79	1,034	2,90
177,98	1058,40	-43,10	1101,50	61,78	1250,07	1,153	2,87
207,98	1058,40	-96,94	1155,34	63,27	1293,56	1,192	2,83
237,98	1058,40	-121,72	1180,12	59,80	1365,43	1,274	3,66
267,98	1058,40	-62,59	1120,99	57,35	1331,36	1,246	3,78
297,98	1058,40	-28,56	1086,96	55,99	1311,22	1,229	3,83
327,98	1058,40	-8,40	1066,80	55,66	1292,05	1,210	3,82
357,98	1058,40	-4,21	1062,62	55,45	1290,18	1,209	3,83

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 0.95
IMMERSION = 90%
RADIUS = 9.910
SLOPE = 15.60

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.84	10.15	518.69	-1.48	699.67	699.44	0.655
57.98	13.86	10.31	518.69	1.82	685.04	684.70	0.640
87.98	13.81	10.29	518.69	3.28	683.39	680.49	0.638
117.98	13.83	10.43	518.69	11.65	671.10	657.28	0.626
147.98	12.96	9.81	518.69	26.57	669.83	599.09	0.624
177.98	11.97	9.75	518.69	-7.47	574.43	569.55	0.530
207.98	12.14	9.75	518.69	-18.47	595.42	564.75	0.550
237.98	13.80	10.24	518.69	-15.39	689.35	664.64	0.644
267.98	13.81	10.28	518.69	-6.80	683.92	679.11	0.639
297.98	13.78	10.13	518.69	-2.88	698.34	697.45	0.653
327.98	13.83	10.15	518.69	-2.24	699.16	698.63	0.654
357.98	13.83	10.19	518.69	-2.51	695.75	695.09	0.651

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	760.22	-18.07	778.29	48.05	1046.40	0.979	2.41
57.98	760.22	21.76	738.46	47.16	1007.04	0.941	2.38
87.98	760.22	62.89	697.33	45.70	974.34	0.910	2.36
117.98	760.22	135.52	624.70	43.54	906.79	0.845	2.30
147.98	760.22	299.61	460.61	37.55	755.69	0.704	1.97
177.98	760.22	-74.68	834.90	55.70	1010.67	0.932	1.83
207.98	760.22	-188.64	948.86	59.24	1104.21	1.020	1.82
237.98	760.22	-182.95	943.17	54.83	1153.82	1.078	2.30
267.98	760.22	-80.98	841.20	51.09	1081.11	1.010	2.36
297.98	760.22	-35.09	795.31	48.75	1057.81	0.990	2.39
327.98	760.22	-27.33	787.55	48.42	1052.77	0.985	2.40
357.98	760.22	-30.47	790.69	48.68	1052.77	0.985	2.40

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 1,51 RADIUS = 17,081 SLOPE = -0,83
IMMERSION = 10%

CIRC, POSITION	TOT, PRESSURE	STATIC PRESSURE	TOT, TEMP,	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO,
15,00	20,87	15,83	596,88	29,14	737,85	644,46	0,641
45,00	20,90	15,96	597,36	30,18	729,59	630,69	0,633
75,00	20,89	15,96	596,67	30,82	728,67	625,77	0,632
105,00	20,65	15,67	596,04	31,73	737,29	627,09	0,641
135,00	19,69	15,72	585,17	39,13	662,58	513,98	0,577
165,00	22,32	16,71	632,94	42,11	777,35	576,68	0,657
195,00	22,56	16,52	642,55	43,71	811,10	586,30	0,682
225,00	23,89	16,97	657,00	38,40	857,52	672,03	0,716
255,00	21,20	15,87	605,92	30,26	760,59	656,96	0,657
285,00	20,89	15,92	598,15	28,09	732,40	646,13	0,635
315,00	20,88	15,93	595,26	28,38	730,00	642,26	0,634
345,00	20,85	15,95	597,82	29,11	727,49	635,60	0,630

CIRC, POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO,	LOCAL WT, FLOW
15,00	1310,32	359,29	951,03	55,88	1148,82	0,998	3,48
45,00	1310,32	366,78	943,55	56,24	1134,93	0,984	3,42
75,00	1310,32	373,33	937,00	56,26	1126,74	0,978	3,40
105,00	1310,32	387,75	922,57	55,80	1115,52	0,969	3,36
135,00	1310,32	418,14	892,18	60,05	1029,64	0,896	2,77
165,00	1310,32	521,25	789,07	53,84	977,34	0,826	3,11
195,00	1310,32	560,49	749,85	51,98	951,85	0,801	3,10
225,00	1310,32	532,65	777,68	49,17	1027,82	0,859	3,60
255,00	1310,32	383,28	927,04	54,68	1136,22	0,981	3,52
285,00	1310,32	344,86	965,47	56,21	1161,73	1,007	3,50
315,00	1310,32	346,98	963,35	56,31	1157,81	1,006	3,49
345,00	1310,32	353,91	956,41	56,39	1148,35	0,995	3,45

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 1.51
IMMERSION = 50%
RADIUS = 14.056
SLOPE = 3.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.17	15.28	600.97	35.88	800.81	648.85	0.698
45.00	21.19	15.24	600.46	36.21	804.99	649.51	0.702
75.00	21.06	15.21	598.89	37.33	798.63	638.04	0.697
105.00	20.82	14.94	597.81	37.88	805.53	635.80	0.705
135.00	19.88	14.94	595.22	44.43	750.11	535.66	0.659
165.00	21.32	15.54	618.44	45.91	800.59	557.04	0.687
195.00	21.26	15.16	629.59	49.79	834.30	538.62	0.712
225.00	22.51	15.67	636.33	42.73	866.73	636.66	0.738
255.00	20.90	14.92	608.61	36.43	818.93	658.90	0.710
285.00	21.51	15.39	605.29	36.63	813.90	653.16	0.708
315.00	21.24	15.34	605.24	36.54	802.78	644.99	0.697
345.00	21.23	15.29	603.01	35.79	804.43	652.52	0.700

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1078.27	469.35	608.92	43.18	889.83	0.776	3.78
45.00	1078.27	475.55	602.72	42.86	886.08	0.773	3.78
75.00	1078.27	484.29	593.97	43.09	869.53	0.759	3.69
105.00	1078.27	494.60	583.67	42.55	863.08	0.755	3.65
135.00	1078.27	525.11	553.16	45.92	770.01	0.677	3.08
165.00	1078.27	575.02	503.25	42.10	750.70	0.644	3.20
195.00	1078.27	637.14	441.13	39.32	696.21	0.594	2.98
225.00	1078.27	588.11	490.16	37.59	803.49	0.684	3.63
255.00	1078.27	486.32	591.99	41.94	885.75	0.768	3.71
285.00	1078.27	485.61	592.66	42.22	881.97	0.767	3.81
315.00	1078.27	477.96	600.31	42.95	881.12	0.765	3.74
345.00	1078.27	470.44	607.83	42.97	891.76	0.776	3.79

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 1,51
IMMERSION = 90% RADIUS = 1,030 SLOPE = 11,17

CIRC POSITION	TOT, PRESSURE	STATIC PRESSURE	TOT, TEMP,	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO,
15,00	21,30	14,67	595,48	39,09	840,46	652,33	0,741
45,00	21,47	14,73	595,59	39,07	845,22	656,21	0,745
75,00	21,14	14,61	592,99	40,52	836,18	635,65	0,738
105,00	20,80	14,40	591,25	41,28	832,96	625,96	0,736
135,00	19,60	14,29	579,92	46,00	769,16	525,54	0,681
165,00	20,76	14,60	596,39	51,93	822,34	507,07	0,722
195,00	19,94	14,42	608,80	57,39	799,62	430,93	0,692
225,00	21,30	14,52	621,49	42,90	871,27	638,24	0,753
255,00	21,22	14,58	605,11	39,92	850,03	651,92	0,743
285,00	21,20	14,73	597,42	39,57	832,33	641,60	0,732
315,00	21,32	14,69	596,56	39,01	840,97	653,46	0,741
345,00	21,24	14,67	597,23	38,61	839,17	655,74	0,738

CIRC POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO,	LOCAL WT, FLOW
15,00	846,14	529,94	316,20	25,86	724,92	0,639	2,22
45,00	846,14	532,72	313,42	25,53	727,22	0,641	2,25
75,00	846,14	543,28	302,86	25,48	704,11	0,622	2,16
105,00	846,14	549,53	296,60	25,35	692,68	0,612	2,10
135,00	846,14	561,61	284,53	28,43	597,62	0,529	1,76
165,00	846,14	647,39	198,75	21,40	544,63	0,478	1,71
195,00	846,14	673,57	172,57	21,82	464,20	0,402	1,39
225,00	846,14	593,09	253,04	21,63	686,58	0,593	2,07
255,00	846,14	545,48	300,66	24,76	717,91	0,628	2,17
285,00	846,14	530,21	315,93	26,22	715,16	0,629	2,18
315,00	846,14	529,35	316,79	25,86	726,20	0,639	2,22
345,00	846,14	523,66	322,48	26,19	730,74	0,643	2,22

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO. = 2.20
IMMERSION = 10%
RADIUS = 17.130
SLOPE = 0.24

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6.83	20.77	17.02	599.14	0.45	631.15	631.13	0.541
36.83	20.70	17.04	598.20	0.58	623.53	623.50	0.535
66.83	20.69	17.10	598.46	0.44	618.10	618.09	0.529
96.83	20.61	17.22	597.11	0.16	598.88	598.89	0.513
126.83	20.08	17.32	593.07	1.11	543.52	543.41	0.465
156.83	20.67	17.34	614.90	1.80	602.05	601.75	0.508
186.83	22.35	17.14	637.73	1.94	748.54	748.11	0.628
216.83	22.49	17.06	648.57	1.79	769.44	769.06	0.641
246.83	22.10	16.84	625.49	1.61	749.75	749.46	0.636
276.83	20.75	16.87	603.34	0.73	645.80	645.83	0.552
306.83	20.67	16.94	598.72	0.45	630.61	630.59	0.541
336.83	20.66	16.93	599.10	0.35	630.15	630.14	0.541

CIRC. POSITION	WHELL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6.83	1314.08	4.95	1309.14	64.26	1453.33	1.246	3.29
36.83	1314.08	6.34	1307.74	64.51	1448.77	1.242	3.26
66.83	1314.08	4.78	1309.30	64.73	1447.96	1.240	3.24
96.83	1314.08	1.65	1312.43	65.47	1442.61	1.235	3.16
126.83	1314.08	10.56	1303.52	67.37	1412.26	1.208	2.87
156.83	1314.08	18.88	1295.20	65.08	1428.16	1.204	3.10
186.83	1314.08	25.40	1288.68	59.86	1490.09	1.250	3.77
216.83	1314.08	24.09	1289.99	59.20	1501.84	1.251	3.80
246.83	1314.08	21.00	1293.08	59.90	1494.57	1.267	3.79
276.83	1314.08	8.25	1305.84	63.68	1456.81	1.246	3.33
306.83	1314.08	4.91	1309.17	64.28	1453.12	1.246	3.28
336.83	1314.08	3.89	1310.19	64.31	1453.85	1.247	3.28

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, = 2,20
IMMERSION = 50% RADIUS = ,420 SLOPE = 1,13

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
29,00	20,75	16,34	598,62	-0,20	688,46	688,46	0,594
59,00	20,65	16,41	596,75	-0,29	674,90	674,89	0,582
89,00	20,53	16,55	596,70	-0,33	654,30	654,29	0,563
119,00	20,49	16,75	593,95	0,33	632,40	632,39	0,545
149,00	19,29	16,85	582,95	-0,46	515,39	515,37	0,444
179,00	20,36	16,65	609,98	-3,05	639,78	638,85	0,544
209,00	20,10	16,24	618,69	-0,89	662,91	662,82	0,560
239,00	21,85	16,07	632,70	0,91	799,50	799,40	0,677
269,00	20,40	16,07	599,86	0,07	689,73	689,73	0,594
299,00	20,71	16,20	601,06	0,14	699,20	699,20	0,602
329,00	20,82	16,23	599,86	-0,09	703,52	703,52	0,607
359,00	20,66	16,31	598,77	-0,07	685,87	685,87	0,591

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
29,00	1106,19	-2,46	1108,65	58,16	1305,02	1,125	3,81
59,00	1106,19	-3,42	1109,61	58,69	1298,73	1,120	3,75
89,00	1106,19	-3,76	1109,95	59,48	1288,45	1,109	3,65
119,00	1106,19	3,64	1102,55	60,16	1271,04	1,095	3,58
149,00	1106,19	-4,10	1110,29	65,10	1224,07	1,054	2,93
179,00	1106,19	-34,02	1140,21	60,74	1307,00	1,111	3,50
209,00	1106,19	-10,33	1116,52	59,30	1298,45	1,097	3,50
239,00	1106,19	12,76	1093,44	53,83	1354,49	1,147	4,19
269,00	1106,19	0,80	1105,39	58,04	1302,93	1,123	3,74
299,00	1106,19	1,68	1104,51	57,66	1307,22	1,126	3,83
329,00	1106,19	-1,07	1107,26	57,57	1311,86	1,132	3,87
359,00	1106,19	-0,85	1107,04	58,22	1302,29	1,123	3,78

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Intermediate Weight Flow (Concluded)

PLANE NO, = 2.20
IMMERSION = 90%
RADIUS = 11.775
SLOPE = 1.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18.56	20.64	15.95	593.22	=0.20	723.99	723.98	0.630
48.56	20.90	15.96	592.76	=0.50	726.46	726.43	0.632
78.56	20.66	16.17	599.85	=0.79	692.19	692.12	0.602
108.56	20.47	16.37	598.87	=0.63	661.33	661.29	0.574
138.56	19.66	16.64	582.90	0.53	570.74	570.72	0.494
168.56	17.77	17.30	575.38	-15.64	229.74	221.23	0.196
198.56	17.49	17.02	598.46	-14.92	235.50	227.56	0.197
228.56	19.63	16.84	616.46	1.38	563.71	563.55	0.473
258.56	21.48	15.72	609.25	=0.65	790.22	790.17	0.683
288.56	21.13	15.80	597.27	=0.17	756.63	756.62	0.658
318.56	21.00	15.77	594.99	=0.44	749.09	749.07	0.652
348.56	20.87	15.86	594.52	=0.08	734.44	734.44	0.639

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18.56	903.29	-2.57	905.85	51.37	1159.62	1.009	2.35
48.56	903.29	-6.38	909.67	51.39	1164.13	1.013	2.36
78.56	903.29	-9.51	912.80	52.83	1145.53	0.996	2.28
108.56	903.29	-7.32	910.61	54.01	1125.39	0.976	2.19
138.56	903.29	5.26	898.03	57.56	1064.04	0.920	1.91
168.56	903.29	=61.94	965.23	77.09	990.26	0.945	0.79
198.56	903.29	=60.62	963.91	76.72	990.41	0.829	0.78
228.56	903.29	13.55	889.74	57.65	1053.20	0.984	1.80
258.56	903.29	-8.94	912.22	49.10	1206.86	1.043	2.49
288.56	903.29	-2.28	905.57	50.12	1180.06	1.026	2.43
318.56	903.29	-5.79	909.08	50.51	1177.94	1.026	2.41
348.56	903.29	=0.96	904.25	50.92	1164.93	1.013	2.37

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow

PLANE NO, = 0.95 IMMERSION = 10% RADIUS = 7.420 SLOPE = -1.92

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.84	10.90	518.69	0.75	640.70	640.64	0.594
57.98	13.82	10.86	518.69	0.13	643.90	643.90	0.597
87.98	13.73	10.90	518.69	1.43	635.55	635.35	0.588
117.98	13.84	10.79	518.69	4.46	653.61	651.63	0.606
147.98	12.12	10.13	518.69	4.13	567.67	566.20	0.522
177.98	12.13	10.06	518.69	-3.92	568.68	567.35	0.523
207.98	12.03	10.41	518.69	-11.98	502.55	491.60	0.459
237.98	13.73	11.60	518.69	-10.70	541.63	532.22	0.497
267.98	13.63	11.45	518.69	-1.49	550.41	550.22	0.505
297.98	13.80	10.84	518.69	0.39	643.48	643.46	0.596
327.98	13.83	10.99	518.69	1.71	629.41	629.13	0.582
357.98	13.81	10.88	518.69	0.58	640.73	640.70	0.594

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1336.33	8.39	1327.94	64.25	1474.40	1.366	3.31
57.98	1336.33	1.46	1334.87	64.25	1482.05	1.374	3.31
87.98	1336.33	15.86	1320.47	64.31	1465.37	1.357	3.28
117.98	1336.33	50.83	1285.50	63.12	1441.23	1.337	3.34
147.98	1336.33	40.88	1295.45	66.39	1413.78	1.300	2.67
177.98	1336.33	-38.88	1375.21	67.98	1487.64	1.368	2.66
207.98	1336.33	-104.31	1440.64	71.16	1522.21	1.392	2.36
237.98	1336.33	-100.56	1436.89	69.68	1532.29	1.406	2.87
267.98	1336.33	-14.31	1350.64	67.84	1458.42	1.339	2.93
297.98	1336.33	4.38	1331.95	64.21	1479.23	1.371	3.31
327.98	1336.33	18.78	1317.55	64.48	1460.05	1.351	3.27
357.98	1336.33	6.49	1329.84	64.28	1476.14	1.368	3.30

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 0.95
IMMERSION = 50%
RADIUS = .797
SLOPE = 4.85

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.91	10.26	518.69	0.57	718.23	718.19	0.672
57.98	13.91	10.27	518.69	1.53	716.99	716.74	0.670
87.98	13.90	10.28	518.69	2.73	714.83	714.02	0.668
117.98	13.91	10.31	518.69	6.16	712.78	708.67	0.666
147.98	12.13	9.68	515.49	6.47	625.14	621.16	0.578
177.98	12.13	9.94	518.69	-8.40	584.32	578.05	0.538
207.98	12.13	10.23	518.69	-15.33	538.04	518.90	0.493
237.98	13.84	11.32	518.69	-10.93	568.53	577.86	0.542
267.98	13.87	10.69	518.69	-2.87	643.17	642.36	0.596
297.98	13.90	10.49	518.69	-0.97	692.02	691.93	0.645
327.98	13.91	10.39	518.69	-0.16	702.85	702.85	0.656
357.98	13.92	10.28	518.69	0.42	716.85	716.83	0.670

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1058.43	7.15	1051.26	55.66	1273.16	1.191	3.81
57.98	1058.43	19.14	1039.26	55.41	1262.44	1.181	3.81
87.98	1058.43	34.05	1024.35	55.12	1248.65	1.167	3.79
117.98	1058.43	76.49	981.92	54.28	1210.94	1.132	3.77
147.98	1058.43	70.44	987.96	57.84	1167.00	1.080	3.04
177.98	1058.43	-85.36	1143.76	63.19	1281.53	1.181	2.88
207.98	1058.43	-142.25	1200.65	66.63	1307.98	1.200	2.64
237.98	1058.43	-111.59	1169.99	63.72	1304.91	1.203	3.28
267.98	1058.43	-32.20	1090.60	59.50	1265.72	1.173	3.55
297.98	1058.43	-11.72	1070.12	57.11	1274.33	1.188	3.73
327.98	1058.43	-1.96	1060.36	56.46	1272.15	1.187	3.76
357.98	1058.43	5.25	1053.15	55.76	1273.95	1.191	3.81

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 0.95
IMMERSION = 90%
RADIUS = 9.910
SLOPE = 15.60

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.90	10.41	518.69	0.53	677.12	677.09	0.632
57.98	13.92	10.51	518.69	1.39	668.41	668.21	0.623
87.98	13.90	10.51	518.69	4.02	666.89	665.25	0.622
117.98	13.92	10.64	518.69	9.71	654.43	645.06	0.609
147.98	12.57	10.07	518.69	19.75	598.46	563.25	0.553
177.98	12.25	10.10	518.69	-11.86	558.42	546.50	0.514
207.98	12.71	10.30	518.69	-25.71	583.72	525.93	0.539
237.98	13.91	10.79	518.69	-18.38	638.82	606.23	0.593
267.98	13.92	10.85	518.69	-5.29	629.78	627.10	0.584
297.98	13.89	10.63	518.69	-0.83	652.35	652.28	0.607
327.98	13.89	10.46	518.69	-0.80	671.22	671.15	0.626
357.98	13.90	10.45	518.69	-0.18	673.10	673.10	0.628

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	760.22	6.26	753.96	48.07	1013.36	0.946	2.37
57.98	760.22	16.21	744.01	48.07	1000.03	0.932	2.36
87.98	760.22	46.75	713.47	47.00	975.49	0.909	2.35
117.98	760.22	110.38	649.84	45.71	915.64	0.852	2.30
147.98	760.22	202.23	557.99	44.73	792.85	0.733	1.87
177.98	760.22	-114.77	874.99	58.01	1031.63	0.950	1.81
207.98	760.22	-253.23	1013.45	62.57	1141.79	1.053	1.78
237.98	760.22	-201.43	961.65	57.77	1136.79	1.056	2.18
267.98	760.22	-58.06	818.28	52.53	1030.94	0.956	2.27
297.98	760.22	-9.45	769.67	49.72	1008.89	0.939	2.32
327.98	760.22	-9.37	769.59	48.91	1021.14	0.952	2.36
357.98	760.22	-2.11	762.33	48.56	1016.96	0.949	2.37

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 1.51
IMMERSION = 10%
RADIUS = 17.081
SLOPE = -0.83

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.91	16.61	605.88	32.71	742.68	624.90	0.641
45.00	22.00	16.65	605.20	33.00	745.66	625.36	0.643
75.00	21.90	16.54	604.69	33.30	748.07	625.25	0.646
105.00	21.85	16.49	604.35	34.15	748.91	619.78	0.647
135.00	20.84	16.66	593.99	40.51	664.98	505.58	0.574
165.00	23.72	17.78	639.29	43.06	779.64	569.64	0.655
195.00	24.00	17.86	657.41	45.24	800.36	563.57	0.664
225.00	24.96	17.69	680.22	43.46	875.37	635.39	0.719
255.00	21.99	16.28	636.20	39.28	794.94	615.33	0.670
285.00	22.26	16.38	615.17	38.45	787.44	616.68	0.676
315.00	22.01	16.97	606.88	34.35	753.97	622.48	0.650
345.00	21.93	16.63	604.88	33.47	743.21	619.97	0.641

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1310.32	401.33	908.99	55.49	1103.07	0.952	3.50
45.00	1310.32	406.11	904.21	55.33	1099.40	0.948	3.51
75.00	1310.32	410.71	899.61	55.20	1095.55	0.946	3.49
105.00	1310.32	420.41	889.92	55.14	1084.47	0.937	3.45
135.00	1310.32	431.96	878.37	60.08	1013.48	0.876	2.84
165.00	1310.32	532.31	778.01	53.79	964.26	0.810	3.24
195.00	1310.32	568.31	742.02	52.78	931.77	0.773	3.13
225.00	1310.32	602.12	708.21	48.10	951.46	0.782	3.43
255.00	1310.32	503.28	807.04	52.68	1014.86	0.855	3.22
285.00	1310.32	489.65	820.67	53.08	1026.55	0.882	3.37
315.00	1310.32	425.43	884.90	54.88	1081.91	0.933	3.47
345.00	1310.32	409.88	900.44	55.45	1093.23	0.943	3.47

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 1.51
IMMERSION = 50%
RADIUS = 14.056
SLOPE = 3.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	22.18	15.86	605.60	37.95	814.92	642.61	0.708
45.00	22.14	15.86	603.89	37.81	811.07	640.79	0.706
75.00	21.96	15.79	603.11	38.30	806.35	632.80	0.702
105.00	21.82	15.65	599.25	39.02	807.55	627.41	0.706
135.00	20.75	15.74	590.14	44.93	733.40	519.22	0.640
165.00	22.60	16.47	623.48	46.67	804.83	552.27	0.688
195.00	22.60	16.28	641.22	52.90	830.36	500.88	0.701
225.00	23.88	16.48	654.12	49.93	888.42	571.90	0.747
255.00	21.27	15.51	625.94	45.89	807.17	561.82	0.687
285.00	21.82	15.57	606.97	40.77	817.94	619.45	0.710
315.00	22.17	15.90	605.43	38.64	811.20	633.62	0.705
345.00	22.29	15.91	604.44	38.27	816.47	641.01	0.711

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1078.27	531.16	577.11	41.93	863.71	0.751	3.86
45.00	1078.27	497.22	581.05	42.20	868.00	0.753	3.86
75.00	1078.27	499.76	578.51	42.43	857.39	0.746	3.80
105.00	1078.27	508.43	569.84	42.25	847.56	0.740	3.76
135.00	1078.27	517.95	560.31	47.18	763.90	0.667	3.13
165.00	1078.27	585.44	492.83	41.74	740.19	0.633	3.33
195.00	1078.27	662.28	415.99	39.71	651.10	0.550	2.91
225.00	1078.27	679.87	398.40	34.86	696.98	0.586	3.34
255.00	1078.27	579.55	498.72	41.59	751.24	0.639	3.16
285.00	1078.27	534.13	544.14	41.30	824.50	0.716	3.65
315.00	1078.27	506.54	571.73	42.06	853.44	0.742	3.82
345.00	1078.27	505.69	572.57	41.77	859.50	0.748	3.88

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 1.51
IMMERSION = 90%
RADIUS = 11.030
SLOPE = 11.17

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.37	14.97	591.86	40.94	822.36	621.21	0.724
45.00	21.43	14.99	594.05	41.31	823.58	618.63	0.725
75.00	21.28	14.93	593.29	42.29	820.51	606.97	0.723
105.00	21.06	14.91	591.11	43.07	808.92	590.93	0.713
135.00	19.95	15.07	581.13	48.96	727.67	477.78	0.641
165.00	21.23	15.35	598.89	54.76	793.06	457.60	0.692
195.00	20.79	15.58	611.22	57.29	758.10	409.67	0.657
225.00	22.19	15.20	632.43	48.38	875.07	581.21	0.749
255.00	21.63	15.22	627.85	41.11	826.12	622.44	0.718
285.00	22.09	15.28	632.07	42.94	841.70	616.18	0.737
315.00	21.51	15.05	595.83	42.21	825.27	611.27	0.726
345.00	21.48	15.07	595.14	42.09	821.62	610.58	0.723

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	846.14	538.87	307.27	26.32	693.05	0.610	2.15
45.00	846.14	543.67	302.47	26.06	686.61	0.606	2.15
75.00	846.14	552.11	294.03	25.85	674.44	0.594	2.10
105.00	846.14	552.40	293.73	26.43	659.91	0.582	2.04
135.00	846.14	548.84	297.29	31.89	562.72	0.496	1.67
165.00	846.14	647.73	198.41	23.44	498.76	0.435	1.60
195.00	846.14	637.89	208.26	20.95	459.56	0.395	1.41
225.00	846.14	654.17	191.97	18.26	612.09	0.524	1.93
255.00	846.14	543.18	302.96	25.95	692.25	0.602	2.14
285.00	846.14	573.40	272.74	23.88	673.85	0.590	2.16
315.00	846.14	554.46	291.68	25.51	677.29	0.596	2.12
345.00	846.14	549.77	296.37	25.89	678.71	0.597	2.13

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 2.20
IMMERSION = 10%
RADIUS = 17.130
SLOPE 3.24

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6.83	21.78	18.07	606.71	0.60	615.39	615.35	0.523
36.83	21.82	18.36	606.66	0.44	617.77	617.75	0.525
66.83	21.73	18.14	605.72	0.37	604.98	604.97	0.514
96.83	21.69	18.26	605.36	0.31	590.74	590.73	0.502
126.83	21.31	18.27	602.34	0.72	558.63	558.58	0.475
156.83	21.99	18.18	622.74	1.79	629.62	629.32	0.529
186.83	23.69	18.02	647.27	2.29	765.20	764.59	0.638
216.83	23.68	17.94	663.51	2.21	779.92	779.34	0.642
246.83	22.06	17.93	655.21	2.58	673.14	672.46	0.552
276.83	21.91	18.02	629.48	2.32	641.29	640.77	0.536
306.83	21.67	18.09	617.83	1.42	609.36	609.17	0.515
336.83	21.62	18.09	606.55	0.71	601.87	601.82	0.511

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6.83	1314.08	6.46	1307.62	64.80	1445.18	1.229	3.36
36.83	1314.08	4.76	1309.33	64.74	1447.74	1.231	3.37
66.83	1314.08	3.90	1310.19	65.22	1443.11	1.227	3.31
96.83	1314.08	3.15	1310.94	65.74	1437.89	1.221	3.25
126.83	1314.08	7.05	1307.03	66.86	1421.39	1.208	3.08
156.83	1314.08	19.69	1294.39	64.07	1439.27	1.209	3.37
186.83	1314.08	30.56	1283.52	59.22	1494.00	1.245	4.00
216.83	1314.08	30.06	1284.02	58.74	1502.03	1.237	3.96
246.83	1314.08	30.31	1283.78	62.35	1449.23	1.189	3.39
276.83	1314.08	25.97	1288.12	63.55	1438.69	1.203	3.37
306.83	1314.08	15.11	1298.98	64.88	1434.72	1.213	3.29
336.83	1314.08	7.44	1306.64	65.27	1438.58	1.222	3.28

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. = 2.20
IMMERSION = 50%
RADIUS = 14.420
SLOPE = 1.13

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
29.00	21.69	17.37	602.22	0.46	667.46	667.44	0.572
59.00	21.65	17.47	602.61	0.31	656.01	656.00	0.562
89.00	21.53	17.69	601.42	0.48	636.42	636.40	0.545
119.00	21.36	17.71	599.08	1.07	612.53	612.42	0.524
149.00	20.29	17.78	589.44	-0.34	506.53	506.52	0.433
179.00	21.21	17.67	616.05	-4.41	614.07	612.25	0.518
209.00	20.51	17.29	623.15	-5.14	597.57	595.17	0.500
239.00	22.32	17.27	642.65	-3.62	738.38	736.91	0.616
269.00	20.74	17.56	617.76	-1.33	587.86	587.71	0.494
299.00	21.66	17.41	634.17	-0.53	662.79	662.76	0.567
329.00	21.76	17.36	603.13	0.64	672.54	672.50	0.577
359.00	21.68	17.34	603.75	0.90	669.66	669.57	0.574

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
29.00	1106.19	5.33	1100.86	58.77	1287.39	1.104	3.88
59.00	1106.19	3.59	1102.60	59.25	1282.99	1.099	3.83
89.00	1106.19	5.33	1100.87	59.97	1271.58	1.088	3.73
119.00	1106.19	11.43	1094.76	60.78	1254.41	1.073	3.61
149.00	1106.19	-3.02	1109.21	65.46	1219.39	1.043	3.00
179.00	1106.19	-47.22	1153.42	62.04	1305.84	1.101	3.50
209.00	1106.19	-53.51	1159.71	62.63	1303.51	1.091	3.28
239.00	1106.19	-46.68	1152.87	57.41	1368.27	1.142	4.03
269.00	1106.19	-13.60	1119.79	62.31	1264.64	1.062	3.31
299.00	1106.19	-6.16	1112.35	59.21	1294.83	1.108	3.85
329.00	1106.19	7.51	1098.69	58.53	1288.16	1.105	3.91
359.00	1106.19	10.54	1095.65	58.57	1284.05	1.100	3.88

Flow Survey Data For Circumferential Inlet Distortion Testing - 100% Design Speed, Near Stalling Weight Flow (Concluded)

PLANE NO, = 2.20
IMMERSION = 90%
RADIUS = 11.775
SLOPE = 1.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18.56	21.15	17.12	593.12	-0.22	646.30	646.29	0.558
48.56	21.15	17.13	593.64	-0.62	646.07	646.04	0.557
78.56	21.00	17.26	591.51	-0.31	622.51	622.50	0.537
108.56	20.88	17.43	591.51	0.53	600.67	600.64	0.517
138.56	20.21	17.75	587.67	2.12	507.00	506.65	0.434
168.56	18.51	18.17	582.69	3.25	193.06	192.75	0.164
198.56	18.25	17.95	603.13	-36.19	185.54	149.73	0.154
228.56	19.33	17.87	622.84	-10.08	407.66	401.36	0.337
258.56	21.75	17.23	611.59	-1.69	688.19	687.89	0.587
288.56	21.94	17.61	600.50	-0.33	712.01	711.99	0.614
318.56	21.31	17.12	592.96	-0.88	657.12	657.05	0.568
348.56	21.13	17.07	594.11	-0.58	650.44	650.40	0.561

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18.56	903.29	-2.47	905.75	54.49	1112.69	0.960	2.22
48.56	903.29	-6.97	910.26	54.64	1116.21	0.963	2.21
78.56	903.29	-3.42	906.71	55.53	1099.83	0.948	2.15
108.56	903.29	5.52	897.77	56.22	1080.17	0.930	2.08
138.56	903.29	18.79	884.49	60.20	1019.33	0.874	1.78
168.56	903.29	10.95	892.34	77.81	912.92	0.773	0.68
198.56	903.29	-109.56	1012.85	81.59	1023.86	0.852	0.50
228.56	903.29	-71.37	974.66	67.62	1054.06	0.871	1.32
258.56	903.29	-20.26	923.55	53.32	1151.58	0.982	2.32
288.56	903.29	-4.05	907.33	51.88	1153.34	0.995	2.42
318.56	903.29	-10.06	913.35	54.27	1125.13	0.972	2.26
348.56	903.29	-6.61	909.90	54.44	1118.46	0.965	2.22

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